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PLANTS OF THE CLAY BELT OF NORTHERN ONTARIO AND QUEBEC

BY

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Air view of Amos in 1952 showing many features characteristic of the Clay Belt. Clay farmlands surround townsite (SE) straddling Harricanaw R. (S to N). Precambrian bed-rock outcrops (centre) in a mixed poplar-spruce woods. On outcrop is small lake with floating bog. Flanking outcrop (N) is long, marshy lake. To SW is round, silted, shallow lake. East of round lake, high black spruce forest merges SE with low muskeg forest. Sandpits (white in photo), S of round lake, mark margin of esker extending *ca.* 100 miles in NNW-SSE direction. Crown copyright, R.C.A.F. No. A13469-78.

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PLANTS OF THE CLAY BELT OF NORTHERN ONTARIO AND QUEBEC

INTRODUCTION AND ACKNOWLEDGMENTS

This report of botanical studies in the Clay Belt is the first attempt to put together an account of the flora of this interesting region. Although traversed by ancient canoe routes and nowadays made readily accessible by railways, roads, and air transport, the Clay Belt has remained neglected by field botanists until recently. For example, in 1952 there were only 65 specimens inserted from this large territory in the National Herbarium of Canada, and these had been collected en route to other areas or incidental to other studies. The lack of material from this portion of the subarctic forest first prompted this investigation. In the commonly used manuals, the vagueness of northern limits of range of subarctic plants contrasts with the detailed outline of southern limits. The situation is further complicated by the high variability of so many species in our flora. According to the manuals, certain populations pass northeastward into poorly defined varieties, or pass insensibly into geographical varieties. All this reflects the need for more detailed knowledge of the boreal forest flora.

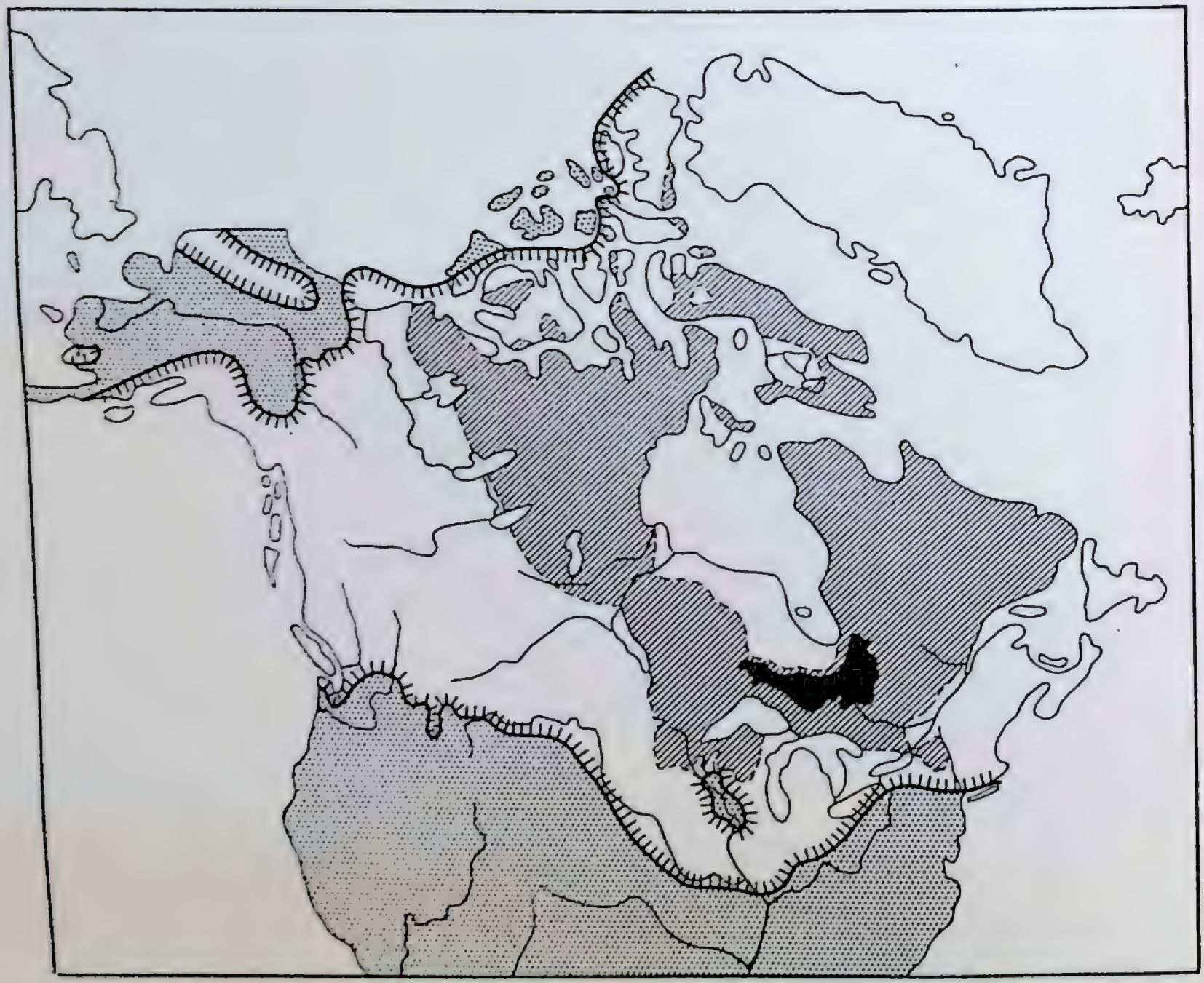
The name 'Clay Belt' itself emphasizes the chief distinction of the region. This belt of clay soils was formed in the basin of glacial Lake Barlow-Ojibway. This was the last, and probably the most short-lived, of the great proglacial lakes of Eastern Canada. The flora of the region has interest, therefore, for the interpretation of the post-Glacial history of subarctic vegetation.

The Clay Belt is situated in the relatively narrow part of the Canadian Shield which lies between the Great Lakes and the Hudson Bay Lowland (Map 1). Moreover, its position on this connection between the eastern division and the central and northwestern division of the Boreal Forest (Map 4) has further phytogeographical significance. There are also two small outliers of Palæozoic bed-rock within the Clay Belt (Map 3). This situation has no precise parallel elsewhere in the Precambrian Shield.

Classifications of the northern forests of Canada all mapped a distinctive Clay Belt region. For Ontario, Sharpe and Brodie (1931) divided the forest area into eight regions, one of which was called the Clay Belt. The boundaries of their region corresponded to the basin of glacial Lake Barlow-Ojibway as far as they were then known or presumed. In his phytogeographical map of Quebec, Victorin (1935) also distinguished an "Enclave argileuse de l'Ojibway" described in the text as "une pénétration de la grande Ceinture d'argile." Halliday's (1937) valuable pioneer work on a forest classification for the whole of Canada, mapped a Northern Clay Section of the Boreal Forest. As can be seen in Map 4, the boundary of Halliday's Forest Section does not entirely correspond with the margin of the glacial lake boundary as presently known, although it does occupy the largest portion. Four other Forest Sections infringe upon the margin of the Great Clay Belt. The remainder of the Barlow-Ojibway Lake basin

was placed in the Haileybury Section of the Great Lakes – St. Lawrence Forest Region. It was therefore desirable to fill in the floristic details of these generalized classifications.

Although there are still large tracts of old and relatively undisturbed forest in the Clay Belt, the country is being opened up rapidly. In preparation for exploitation of this forest area, the Forest Resources Inventory (Ontario, 1953) estimated that 80 per cent of the volume of the wood in the Cochrane District was in mature stands. There was, therefore, some urgency to undertake this investigation before these forest communities were disturbed by artificial factors on a larger scale.



Map 1. Relation of the Clay Belt (solid black) to the greatest extent of Pleistocene glaciation (hachured line, with contiguous unglaciated areas stippled) and to the whole Precambrian Shield (oblique ruling).

For our purposes, the boundary of the Clay Belt is the margin of glacial Lake Barlow-Ojibway as outlined in the Glacial Map of North America (1949) and shown here on the accompanying maps. Since mapping of the glacial lake beaches is incomplete, this boundary is somewhat arbitrary in detail. In the field we kept within the area of lacustrine deposits and stopped short of the surrounding glacial drift over Precambrian bed-rock. The situation is complicated along the north-central margin

by a re-advance of the glacier toward Cochrane, and in the northeast by the proximity of the area of marine submergence southwest of James Bay (Map 3).

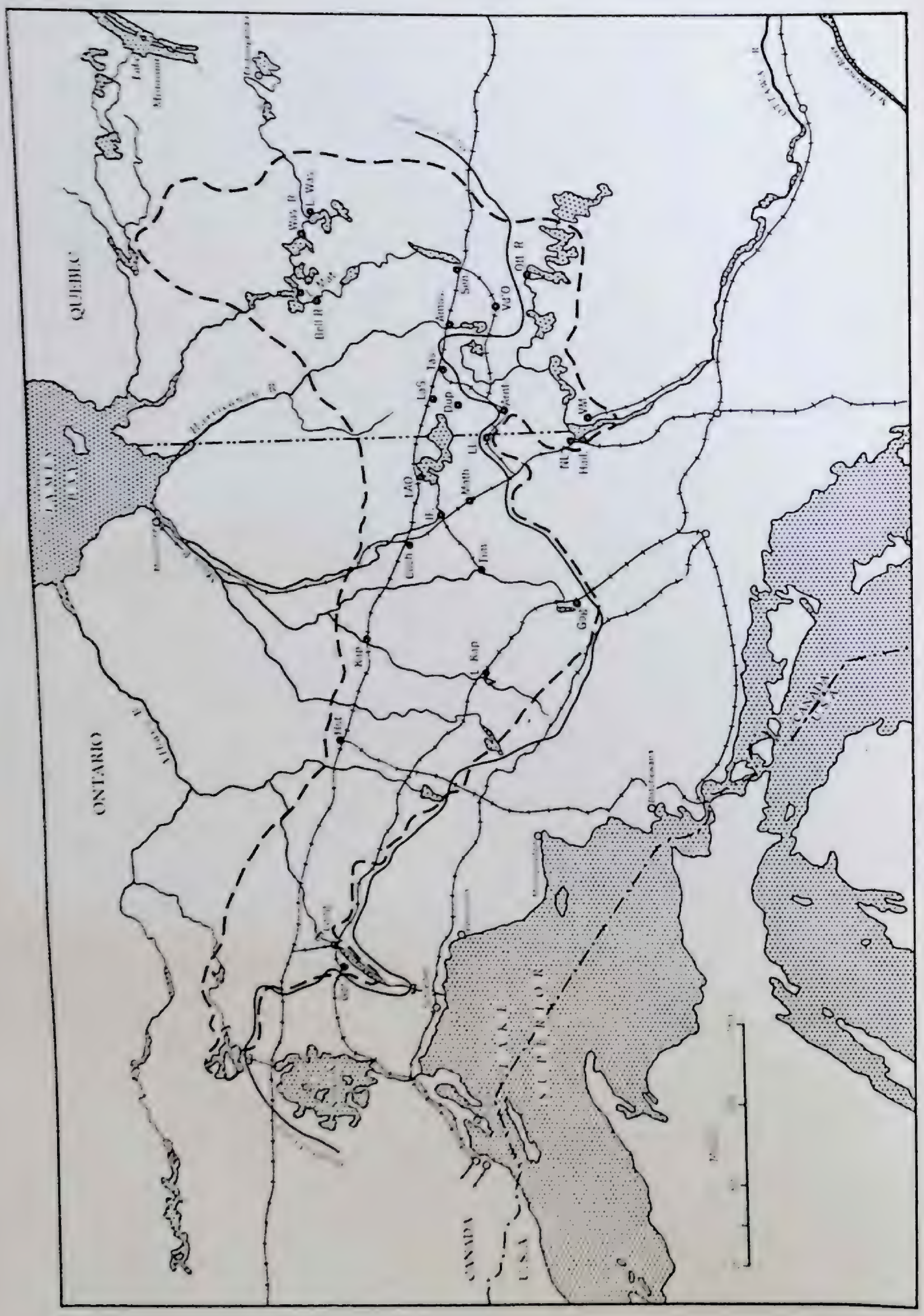
The main basis for this study is the collection amounting to 3,969 numbers and 16,464 herbarium sheets of the three field seasons of 1952, 1953, and 1954. The first set of specimens is inserted in the National Herbarium of Canada. In the first season we travelled by truck over most of the road system that traverses the Clay Belt in an east to west direction and made as many side trips as possible. Places remote from roads were reached in the following seasons by canoe, railway, and aircraft. Thus, coverage of the region was as complete as possible within the time available. The schedule was also planned so that each major section of our area was visited in early, mid, and late season.

These investigations were undertaken as part of the floristic program of the National Herbarium of Canada. The writer gratefully acknowledges the supervision given by the Chief Botanist, Dr. A. E. Porsild, who looked at every specimen in the collection, and the many helpful suggestions given by my colleague, Dr. H. J. Scoggan. Acknowledgment is also made of the seasonal field assistance of Mr. A. J. Breitung in 1952, whose excellence and experience in collecting were much appreciated, and of Mr. W. John Smith in 1953 and 1954, whose record of bird observations added to the value of our work in the less accessible areas.

For special taxonomic aid, the writer is indebted to Dr. Etlar L. Nielsen of Madison, Wisconsin, U.S.A., who critically examined all specimens of *Amelanchier*. Dr. Hugh M. Raup kindly helped in the determination of *Salix* by going through the first season's collection with the writer. Dr. W. G. Dore looked at all our collections of *Gramineae* and made valuable suggestions on the treatment of difficult genera.

Dr. I. Hustich of Helsingfors, Finland, while engaged in forest botanical work in 1952, accompanied us for short periods and maintained a helpful and stimulating interest throughout the project. Mr. I. J. Bassett very kindly furnished field notes of Clay Belt collections made by himself and other officers of the Department of Agriculture, Canada, in the course of the weed survey. Especially appreciated was the valuable advice received from Dr. A. S. MacLaren and Dr. V. K. Prest, of the Geological Survey of Canada, and from D. W. MacLean of the Forest Research Division, Department of Northern Affairs and National Resources, Canada, who were familiar with the region through field work in their own subjects.

We were greatly aided in our work by resident officers of the federal and provincial governments. It is not practical to list all their names and services here. Particular acknowledgment, however, is due to the following, who accompanied us in the field or brought specimens to our attention: Canada: D. F. Lynn, D. W. MacLean, K. G. Coates, and M. R. Wianeko; Ontario: G. M. Mills, E. K. E. Dreyer, P. Dolan, T. Cooke, R. Woodall, E. Nelson, G. A. Hamilton, M. Loucks, H. Whalen, J. M. Taylor, H. Cumming, S. Suter, E. Hall; Quebec: J.-P. Martel, S. Simard, R. House, S. Bastien, A. Comeau. Practical help was gratefully received from officers of the power, pulp, and paper companies operating in the area, particularly V. P. van Vlymen (Abitibi Co.), E. Bonner (Spruce Falls Co.),

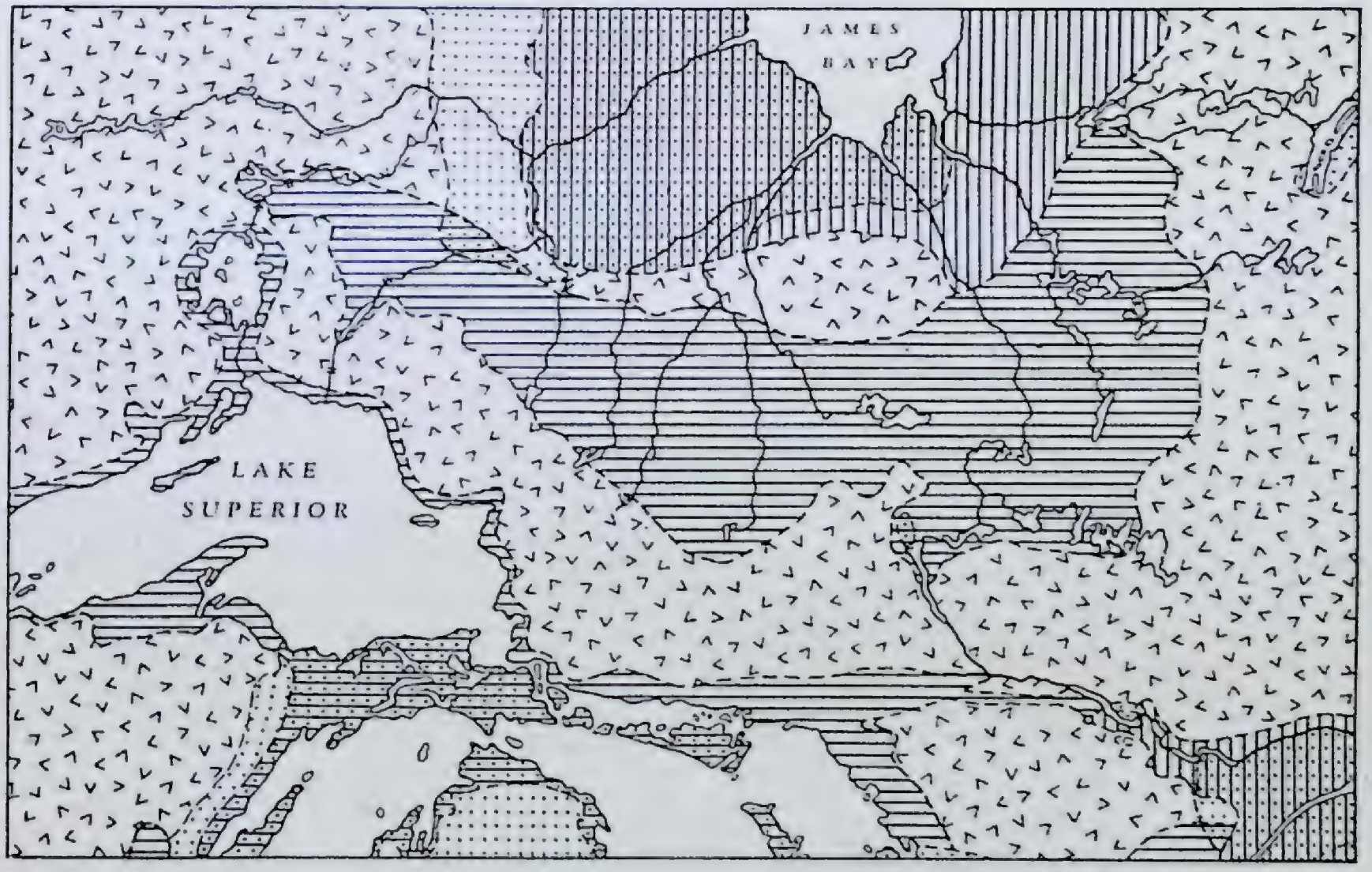


Map 2. The Clay Belt (broken line), place names (abbrev. given under Collecting Localities, p. 50), and drainage systems (height of land a continuous line).

R. Sexsmith (Longlac Co.), and A. T. Catto (Canadian International Co.). Many private residents also helped us in the field. Special thanks are due to J.-C.-A. St-Onge of Amos; J.-W. Pomerleau of Les Clercs de St-Viateur, La Ferme; C.-E. Dorion of Ville-Marie; J. C. Currie of Waswanipi Hudson's Bay Company Post; and F. N. Cowell of Timmins.

GENERAL CHARACTER OF THE REGION

The Clay Belt is a distinct physiographic region lying toward the southern margin of the Precambrian Shield (Map 1). It is one of twenty natural regions recognized in Canada from a geographical point of view by Taylor (1947). It extends as a flat clay plain of about 70,000 square miles as outlined in Map 2. From east to west it is about 600 miles long. From south to north it is widest at the east end (about 260 miles) and tapers narrowly westward.



Map 3. The Clay Belt in relation to surrounding Precambrian Shield (scattered V's), Palæozoic sedimentary rocks (stippled), post-glacial lakes (horizontal ruling), and marine submergence (vertical ruling).

Most of the region drains northward into James Bay (Map 2). Much of the land has a covering of wet peat resulting from poor drainage and cold, wet, climatic conditions, which exist now and evidently have prevailed since the final drainage of glacial Lake Barlow-Ojibway.

The forest cover is predominantly of black spruce. Muskeg and bog occur where the drainage is worst, and mixed spruce and poplar forest occupies the better drained sites. Jack pine forest covers the porous soils of sandy outwash and gravel ridges, formed during the advance and retreat of the glacier.

The underlying Precambrian bed-rock is of considerable variety. From the mainly acid rocks of the typical granitic Precambrian country it varies all the way to rocks of strongly basic composition. There are richly mineralized areas in the bed-rock on which the silver, gold, and base metal mining operations have developed. Precambrian rock knobs occasionally rise above the clay plain (Plates II A, III A, X A), but their tops are rarely over 1,500 feet above sea-level. Air photos emphasize the importance of the eroded and faulted surface of the Precambrian bed-rock (Wilson, 1918) in the structure of our region (frontispiece).

Two small areas of Palæozoic sedimentary rocks are exposed within the Clay Belt (Map 3). One of these is the very small limestone area on Lake Waswanipi with only 70 feet exposed, 5 feet above low water (Clark and Blake, 1952). The other is the more important outlier forming a low ridge at the north end of Lake Timiskaming (Hume, 1925). Overlooking Sutton Bay is a high limestone cliff, on which we searched vainly for calciphilous plants not to be expected elsewhere in the Clay Belt. The farmlands of the Little Clay Belt surround this limestone area (Plate III B), which is only about 9 by 35 miles in extent. The degree of isolation of these Palæozoic outliers may be appreciated from the fact that the nearest Ordovician rocks are 150 miles southeast in the Ottawa Valley, and the nearest Silurian (and more Ordovician) are 170 miles southwest on Manitoulin Island in Lake Huron. The amount of lime in the soils of the Clay Belt generally, is the result of glacial transport of material from the Palæozoic bed-rock of the Hudson Bay Lowland. The increase in the lime content of soils from east to west across the Clay Belt (MacLean and Bedell, 1955) is related to the direction of movement of the glacier and the configuration of the Palæozoic basin around the foot of James Bay (Map 3).

The character of the Clay Belt's surface has been formed chiefly by Pleistocene events, and its relation to the maximum extent of glaciation is shown in Map 1. Radiocarbon dating of fossil peat (Karlstrom, 1956) indicates that the Cochrane area of the Clay Belt may have been under continuous ice cover from before 36000 until some time before 4500 B.C. Evidence from counts of varved clays (Plate II B) at the end of North American chronology by this method (Antevs, 1925), and other correlations suggested that the drainage of the great glacial lake occurred 11,300 years before the present (Antevs, 1953), after a lacustrine period of 2,000 years. The chronology of Pleistocene events in this area is still obscure, with incomplete evidence and conflicting opinions and must await clarification by detailed study of the whole glacial lake basin.

From his work in northern Ontario, Coleman (1909) gave the first description of the last of the great glacial lakes, which he named Lake Ojibway. This lake was formed from the waters dammed by the height of land north of Lake Superior as the glacier retreated beyond the divide. Coleman noted beaches along the southern margin at elevations of a little over 1,000 feet above present sea-level. He believed that only a few thousand years have elapsed since the last glacial lake drained. He observed also that the present drainage is still imperfect, leaving wide stretches of bog and muskeg in many parts of its bed.

From his studies in the Lake Timiskaming area of Quebec, Wilson (1918) named the proglacial lake covering that portion "Lake Barlow."

Later, Antevs (1925) undertook a detailed study of the varved clays following the retreat of the ice-sheet in Eastern Canada. He noted that there was no certain distinction between the limits and deposits of Lake Ojibway and Lake Barlow, and proposed the name Lake Barlow-Ojibway for the huge lake which resulted from their merging.

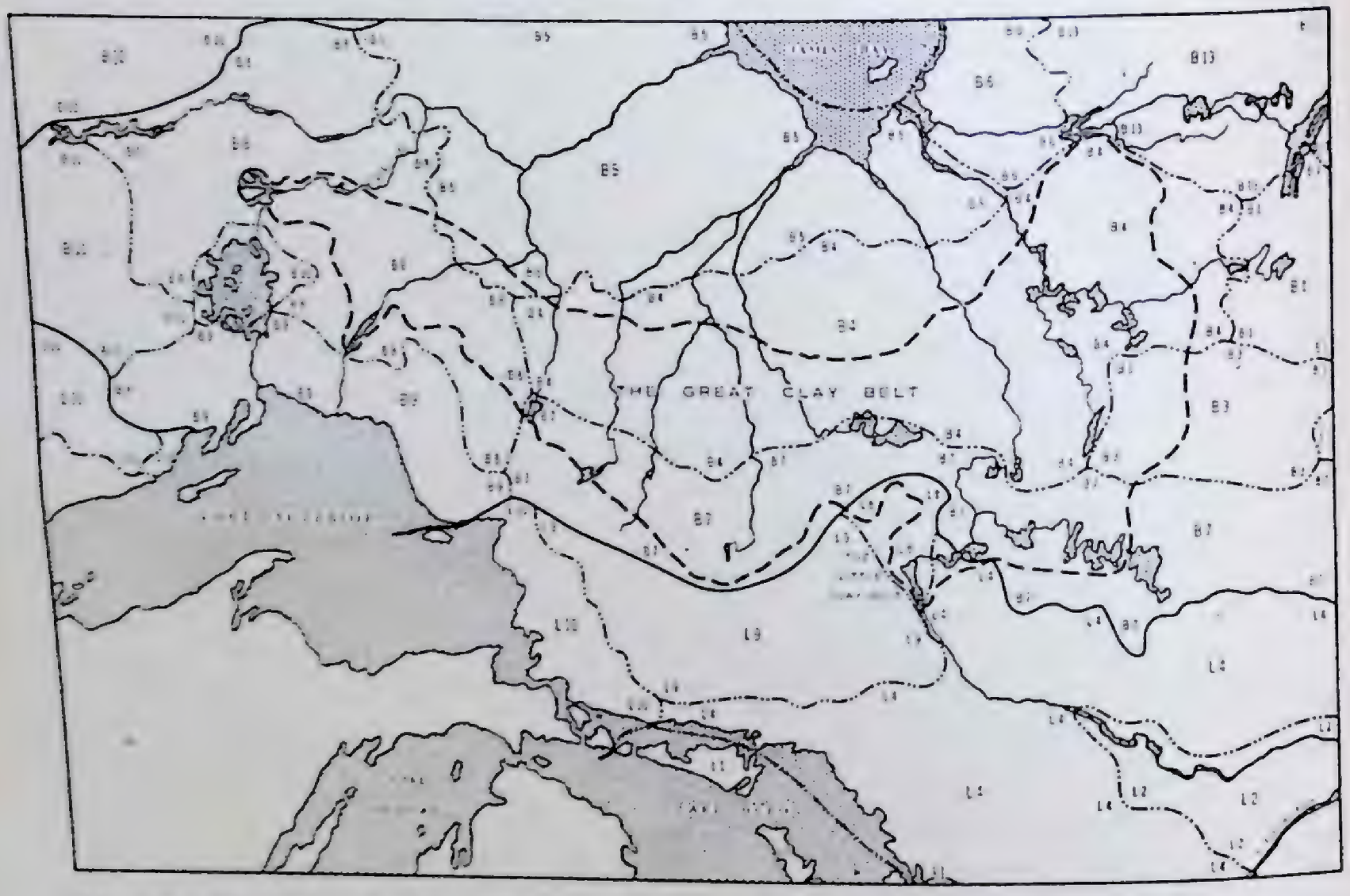
It is evident that a few of the higher hills of the Clay Belt stood as islands even above the highest levels of Lake Barlow-Ojibway. One of the clearest of these is Plamondon Hill north of Taschereau. Wilson (1938) described the crest (1,800 feet above sea-level by aneroid) of Plamondon Hill as covered with heavy drift down to the 1,500-foot contour. From 1,500 to 1,100 feet the impressive boulder beaches and bare rock indicate strong wave-action and a gradual lowering of the glacial lake-level. Below 1,100 feet the land is covered with the silty bottom deposits of the typical Clay Belt plain. This hill and others in the same area were visited in 1954 with the idea that some different species might have survived from the period of isolation on these ancient islands. We found, however, no significant change in the flora from the usual upland vegetation. As the glacial lake-level lowered (Gill, 1929), many of the present-day hills (Plate III A) must have been islands for longer or shorter periods. Later, lake beaches were found from the highest level down to a few feet above the present level of Lake Abitibi (868 feet; *see* Plate IV A), and Lake Timiskaming (575 feet). It is unlikely that Lake Barlow-Ojibway ever covered the whole region, as outlined (Map 3), at one time. Probably different parts were covered by the proglacial lake and subsequent smaller lakes at different periods and for different lengths of time.

In much of the Clay Belt, the glacial lacustrine varved clays are clearly defined and undisturbed (Plate II B). They have a total depth of about 250 feet (Hume, 1925) in the Little Clay Belt. In the north-central portion around Cochrane, the clayey till of the land surface indicates a later re-advance of the ice. This re-advance has obscured evidence on which the northern limit of the glacial lake could be mapped. Moraines trending eastward north of the Turgeon River may indicate the most northerly position of the ice front prior to mass wastage (MacLaren, 1951). According to Karlstrom (1956), the period of the Cochrane re-advance was probably a time of halting of the ice front, preceded by the rapid retreat during the Timiskaming period of Pleistocene chronology and followed by another period of rapid retreat to the stage where the continental ice-sheet disappeared from the Hudson Bay region.

The present divide between the Great Lakes – St. Lawrence and the James Bay drainage systems passes along the southwestern margin but north of the southeastern margin of the Clay Belt (Map 2). The degree of postglacial warping (Lougee, 1953) that would account for this change in the position of the height of land from the time of Lake Barlow-Ojibway has yet to be fully worked out. Many other problems, such as the eastern limit of the glacial lake (Norman, 1939) and the nature and level of the glacial lake outlet at Timiskaming (Blanchard, 1949), remain to be solved.

To explain the northern occurrence of a few halophytic species, the possibility of a marine connection between Hudson Bay and the St. Lawrence basin was suggested by Potter (1932). This connection would have passed through the middle of the Clay Belt on the line Lake

Timiskaming – Lake Abitibi when the land was depressed after being covered with ice. Polunin (1940) remarked that several of the eleven species mentioned in support of Potter's theory may have migrated by the present-day sea connection through Hudson Strait. Moreover, geological and palæontological evidence, according to La Rocque (1949), is against Potter's suggestion, though he notes that the possibility remains of a marine connection farther east between Lake St. John and James Bay.



Map 4. The Clay Belt in relation to Halliday's forest classification.

Sections of Great Lakes – St. Lawrence Forest Region:
L.1 Huron-Ontario, L.2 Upper St. Lawrence, L.4 *Algonquin-Laurentides,* L.8 **Haileybury,** L.9 Timagami, L.10 Algoma, L.11 Quetico, L.13 L. Superior West.

Sections of Boreal Forest Region:
(A) Eastern Division:
B.1 Northeastern Coniferous, B.3 *Central Laurentian,* B.4 **Northern Clay,** B.5 *Coastal Plain,* B.6 East James Bay, B.7 **Central Transition,** B.8 **Central Plateau,** B.9 Superior, B.10 Nipigon, B.11 Western Transition;
(B) Central and Northwestern Division:
B.22 Northern Coniferous.

Sections with major portions within Clay Belt are in boldface; minor ones are italicized.

In view of the gaps in our knowledge of post-Glacial events in this part of North America, only guesses can be made as to what happened to the vegetation of the Clay Belt region following the drainage of glacial Lake Barlow-Ojibway. By correlation with the better-understood chronology of northwestern Europe (Karlstrom, 1956), it can be presumed that there was a rise in temperature from aretic conditions to a warm period, followed by a decline to the present day. A more temperate flora could have grown

northward during that warm period. This raises the question whether some species, presently at their northern limit for these latitudes in the Clay Belt, once spread farther north and are now in a position of retreat. The answer to this question must also await evidence, such as will come from the study of fossil pollen grains in the peat.

The work of the glacier is nowadays apparent in the Clay Belt from the striæ on the surface of the bed-rock, from glacial till, and from drumlinoidal features (Dean, 1956), moraines, kames, and eskers. Much more characteristic of our area are the lacustrine clays (Plate II B), old lake beaches (Plate IV A), and sandy outwash plains (Plates VI and X B), which mark the work of proglacial Lake Barlow-Ojibway and subsequent smaller lake stages. The poor drainage that followed these events is recorded in the peat which covers much of the land surface and has not been incorporated in the soil. Peat is still forming in the boggy depressions (Plates II B, V A, IX, and XI A). The reworking of all these materials is now seen best along the silted shores of the larger of the present rivers (Plate XIII A) which have a remarkably high spring flood-level. Although there are several cursory references in the literature to permafrost in our

Table 1. Temperature and Sunshine

	Kapuskasing, 1918 to 1951				Amos, 26 years	Haileybury, 36 years
	Temperature			Sunshine	Temperature	
	Highest recorded for month °F.	Lowest recorded for month °F.	Monthly average of daily mean °F.	Average, bright sunshine hours	Monthly average of daily mean	
					°F.	°F.
January	47	−53	−1	75	−1	7
February	53	−52	3	102	1	8
March	67	−43	14	130	15	20
April	84	−23	31	169	31	37
May	92	9	46	205	46	51
June	96	20	57	213	57	62
July	101	31	62	234	62	66
August	95	25	60	200	59	63
September	89	20	51	133	51	55
October	82	3	40	89	39	43
November	68	−33	23	47	24	28
December	60	−49	7	51	7	13
Annual	101	−53	33	1,647	33	38

area, we found none. Frost and ice do lie late in the wet peat-covered ground, but there is no evidence of true permafrost as far south as the Clay Belt.

The contemporary climate of the Ontario portion of the Clay Belt has been fully analysed by Chapman (1953), and its relation to agriculture has been considered by Wiancko (1953) on the basis of weather records taken at the Experimental Station, Kapuskasing. The relation of climate to forest classification has been summarized in a special appendix by

Table 2. Precipitation and Evaporation

	Kapuskasing		Amos, 26 years	Haileybury, 36 years
	Precipitation 1918–1951	Evaporation 1945–1951	Precipitation	
	inches	inches	inches	inches
January	1.86	From	2.71	2.01
February	1.36	free	1.39	1.77
March	1.71	water	2.05	2.19
April	1.74	surface:	2.22	2.04
May	2.16	.....	2.22	2.69
June	2.66	2.66	3.09	2.83
July	3.20	3.36	3.76	3.79
August	3.04	2.76	3.48	2.93
September	3.20	1.47	3.76	3.62
October	2.19	.....	2.90	3.08
November	2.36	.....	2.91	2.45
December	2.05	.....	2.24	2.18
Total annual snowfall	92.7	.....	105.8	91.9
rainfall	18.26			
precipitation	27.53	.....	32.73	31.58
Extremes				
1918	17.75			
1921	37.68			

Halliday (1937), wherein our region is tabulated with all the forest sections of Canada. Only representative data, therefore, will be given here from the Kapuskasing station (Wiancko, 1953) with some comparative figures from the Quebec portion of the Great Clay Belt and from the Little Clay Belt (Climatic Summaries, Canada, 1947).

After recognizing the Clay Belt as a natural region for forest classification and geography, it is significant that Chapman's (1953) analyses of

the northern Ontario climate confirm this regional character. Chapman distinguishes a 'Northern Clay Belt' regional climate for the Ontario portion of the Great Clay Belt (*See* Map 4). He places the Little Clay Belt in a more southern climatic region, which includes North Bay and Sault Ste. Marie.

Table 3. Snowfall, Killing Frosts, and Length of Season

Kapuskasing, 1918–1951 (Wiancko, 1953)

Snowfall	Average dates
Last in spring	May 8
First in autumn	October 5

Killing frosts 28°F. or lower	Last in spring	First in autumn	Number of days above 28°F.
Average	May 27	Sept. 22	118
Shortest crop season, 1921	June 18	Aug. 11	54
Longest crop season, 1938	May 13	Oct. 23	163

Growing season, mean temperature 42° and over (Chapman, 1953)

——	Timiskaming	Northern Clay Belt
Beginning	April 25	May 7
End	Oct. 17	Oct. 8

The most favourable feature of the Clay Belt climate for plant growth is the coincidence of midsummer warmth and rainfall. Our region lies in a broad belt having uniform mean temperatures of 61° to 63° F. in July with adequate rainfall and sunshine. Winds are light and storms infrequent. Unfavourable features are the shortness of the growing season and the frequency of late frosts in spring and early killing frosts in autumn. The data summarized in the tables emphasize the significant climatic differences between the Little Clay Belt in the south and the Great Clay Belt in the north. The only considerable difference from east to west is a decrease in wetness (surplus of precipitation over water need expressed as potential evapotranspiration). Moisture is abundant, however, at all seasons throughout the region.

There has been no significant change in climate for the period on record. A small increase in mean temperature recorded at Kapuskasing is insignificant (Chapman, 1953) and does not support the popular local belief that the climate has ameliorated since the early days of settlement.

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Table 4. Precipitation-Effectiveness and Temperature-Efficiency Indices

(From Halliday, 1937)	Haileybury Forest Section (L.8)	Northern Clay Belt Section (B.4)
Precipitation-Effectiveness Index	98.4	91.7
Humidity province	Humid plus	Humid
Temperature-Efficiency Index	35.5	30.6
Temperature province	Temperate	Cool temperate plus
Rainfall periodicity	Moisture abundant at all seasons	
Temperature periodicity	64.9	67.9

PLANT COMMUNITIES

Forests

Tree species

Since forests are the chief plant communities of the Clay Belt, this section may best be introduced by considering all the tree species of our region. Under trees are listed those species treated in *Native Trees of Canada* (1949) and other species of equivalent stature, some of which are on the borderline of tall shrubs. On this basis there are altogether 53 species classed as trees, plus four additional varieties. It is possible that seven more species may be found as rare northern outliers within the margins of our region. Our tree species are divided below into seven groups based on frequency, abundance, range, and geographical affinities.

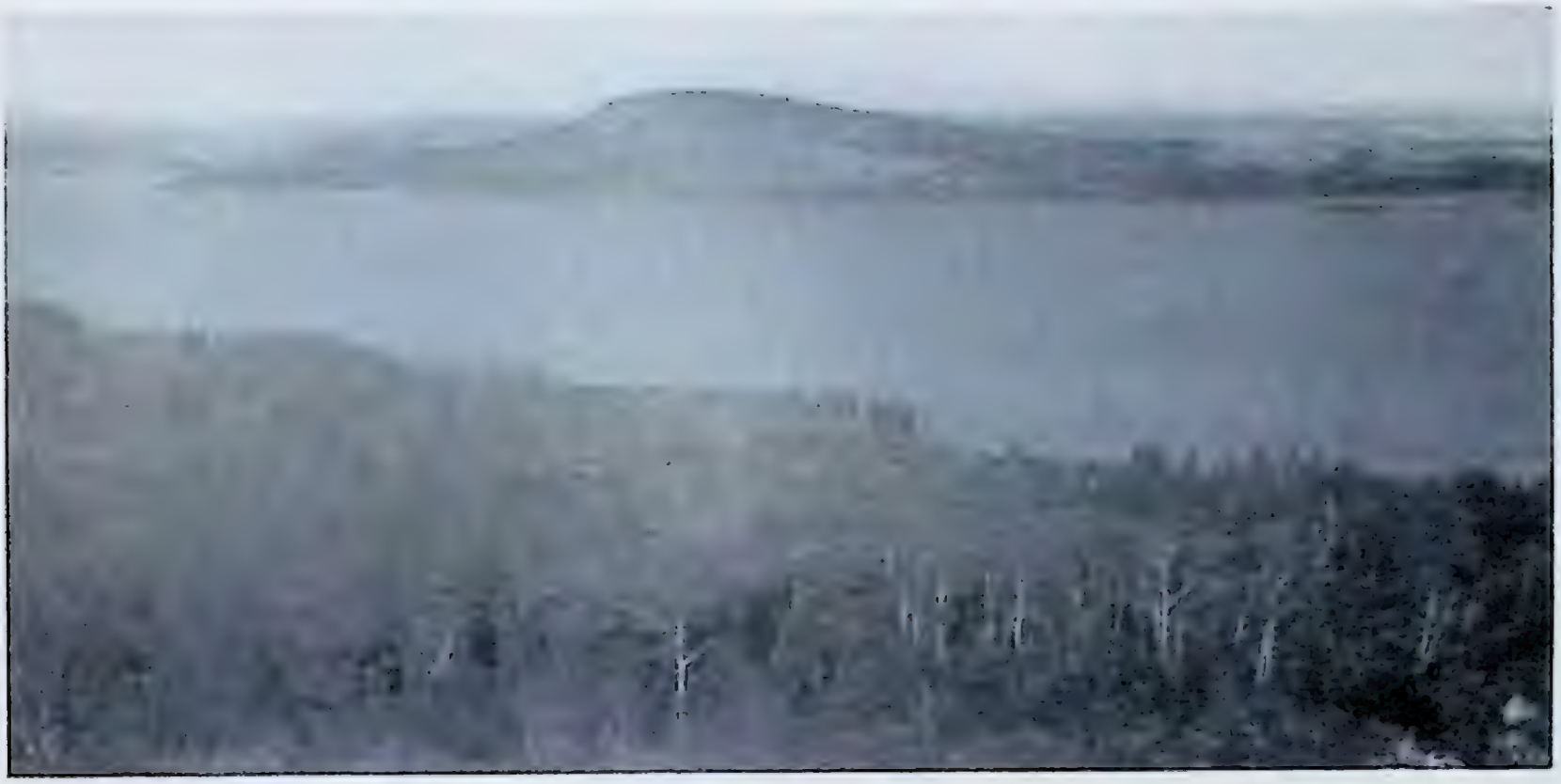
Picea mariana

Black spruce stands in a class by itself since it is by far the most abundant tree of our region. It is indeed the characteristic tree of the typical, poorly-drained clay plain (Millar, 1936). It constitutes 59 per cent of the forest in the Abitibi Division, according to records supplied by Mr. V. van Vlymen of the Abitibi Company. The Abitibi Division is centrally located and is probably fairly representative of forest conditions for the whole region. Ranging from coast to coast in the boreal forest, the geographical affinities of black spruce are (arctic) subarctic American.

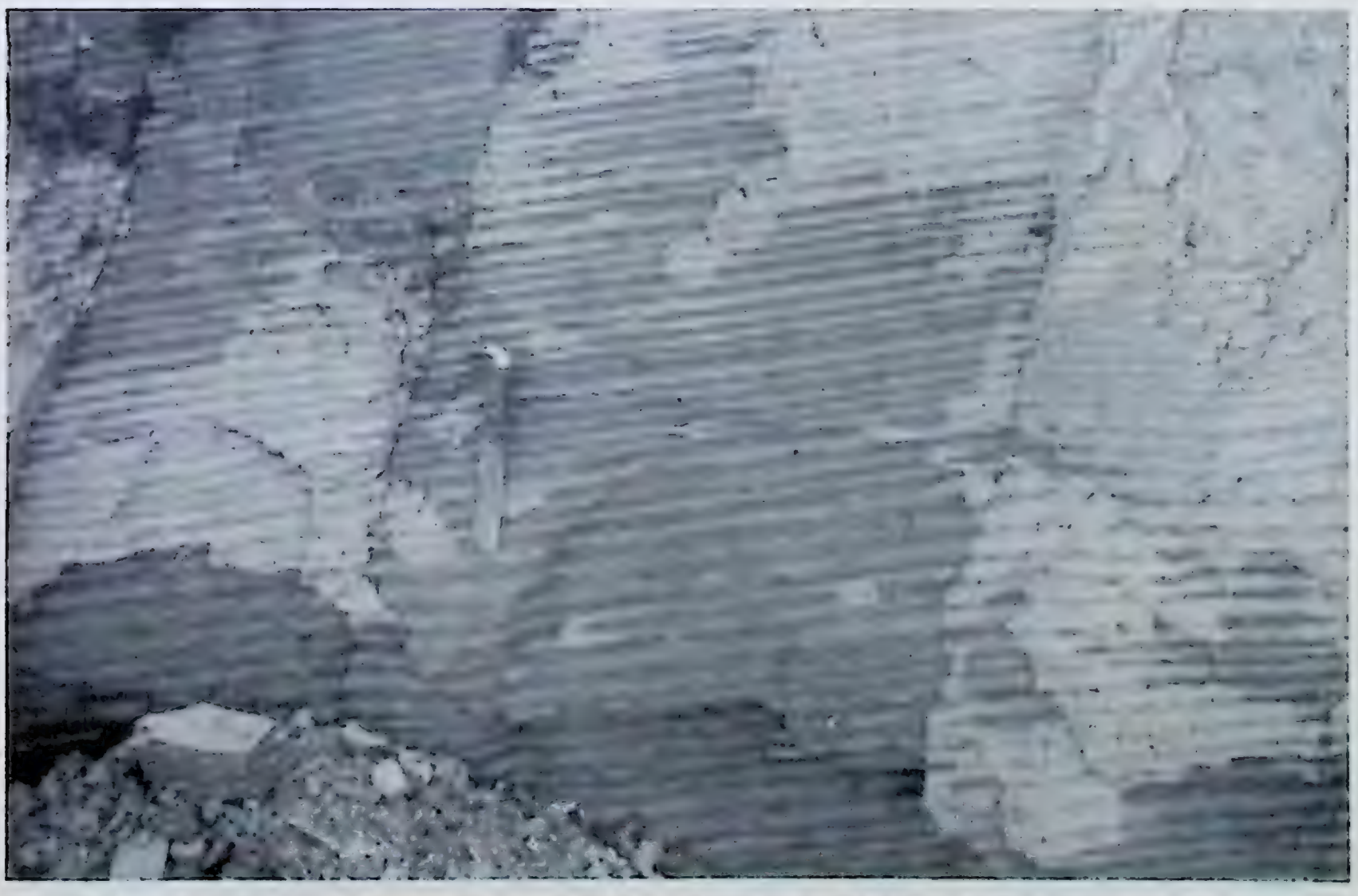
Abies balsamea
Populus tremuloides
Pinus Banksiana
Betula papyrifera, and var. *cordifolia*

In this group are four of the commonest tree species. Although each is very much less abundant (12 to 5 per cent) than black spruce, taken together they constitute 35 per cent of the forest of the Abitibi Division. Their geographical affinities are all with the subarctic forest: balsam fir

PLATE II



A. Rock knob and mixed forest (trembling aspen predominant) at Lake Timiskaming.



B. Varved clay exposed on shore of Lake Abitibi at Lightning Point, Ontario.

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and jack pine ranging from the Atlantic Coast westward to the Mackenzie River basin, trembling aspen and white birch westward to the coast of Alaska. Balsam fir forms the understory of the best Clay Belt forest and is becoming relatively more numerous by regeneration on cut-over black spruce woods (Bonner, 1941, and Hosie, 1953). Aspen poplar is the tallest tree of our forest, reaching heights of about 90 feet in 100 years of growth (MacLean and Bedell, 1955). Its windborne seeds rapidly establish this species on recent burns and disturbed ground where it forms large stands on the drier sites. Jack pine forms extensive and distinctive stands on dry sandy areas, which continue in this community where hazard is high and fires are frequently repeated. In old jack pine forest, black spruce invades the community. White birch is the typical tree of open sites, on shores, rocky areas, recent burns, and hilltops (where the var. *cordifolia* sometimes forms considerable stands).

Picea glauca
Populus balsamifera, and var. *subcordata*
Larix laricina
Thuja occidentalis
Ulmus americana
Fraxinus nigra

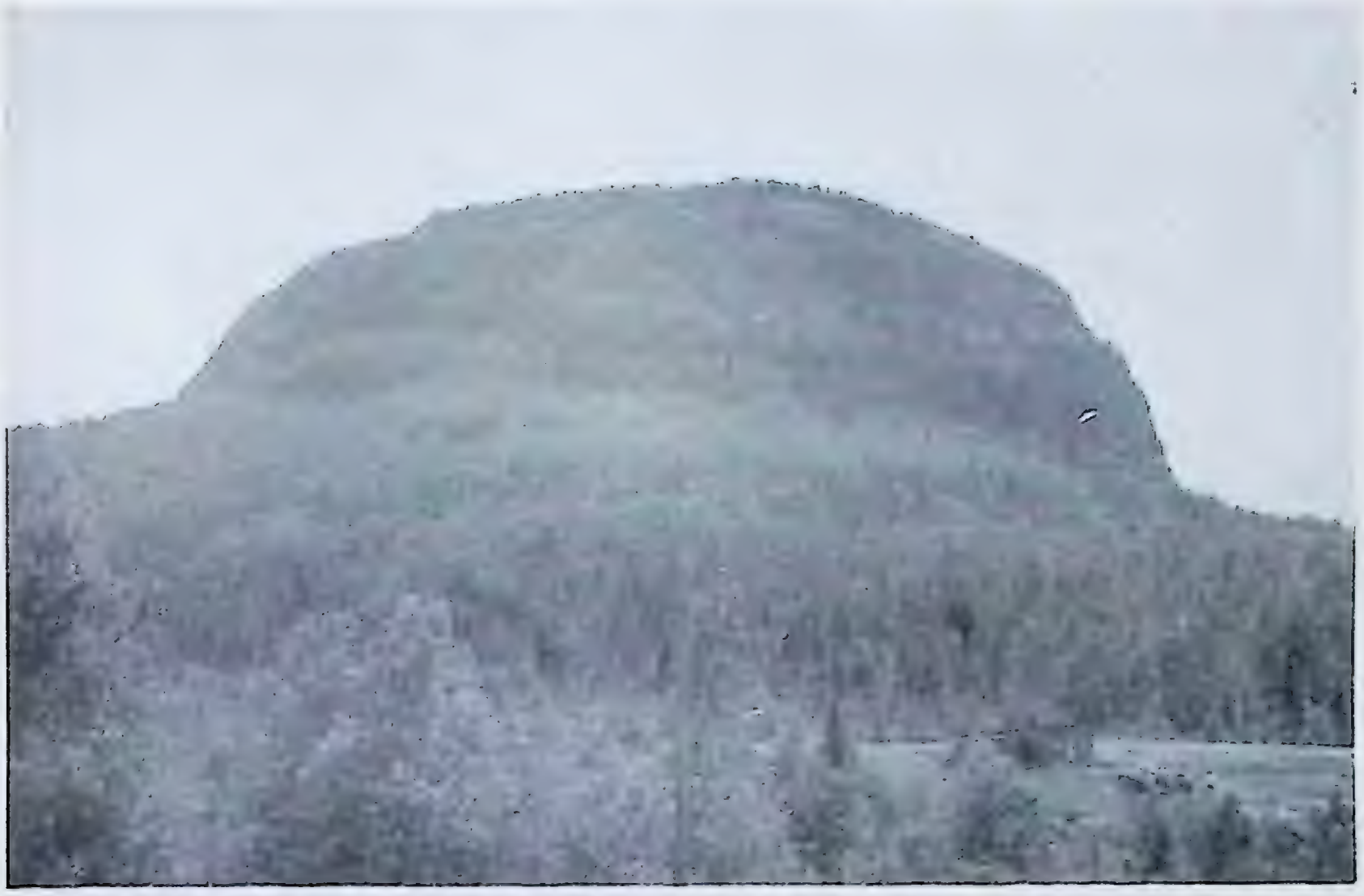
Of these less abundant tree species, white spruce and balsam poplar each constitute 3 per cent of the forest in the Abitibi Division. The remaining species are reported as traces by the foresters and make up less than one per cent of the forest. The first three species have the same (arctic) subarctic geographical affinities as the predominant black spruce, whereas the last three are trees of more temperate eastern America.

Alnus rugosa var. *americana*
Betula pumila var. *glandulifera*
Salix Bebbiana
Prunus pensylvanica
Salix discolor
Alnus crispa var. *mollis*
Prunus virginiana
Acer spicatum
Sorbus americana
S. decora
Amelanchier sanguinea
Betula minor
B. borealis

All the remaining trees whose ranges extend throughout the Clay Belt, and north of it, are placed in this group in order of abundance. They are either low trees or tall shrubs. Speckled alder grows in vast thickets on the wet flat lands and is becoming even more numerous as it occupies former black spruce habitats, following cutting and clearing of the old forest. The first seven in this list include most of the abundant high thicket species of our region. They are wide-ranging subarctic to (subarctic) temperate American plants. The geographical affinities of the remaining six species are with eastern America. Of the last six, mountain maple rates highest in abundance, possibly ranking next to the alders among the low trees of our region. It occurs most frequently on drier sites in openings in stands of deciduous trees.

Pinus Strobus
P. resinosa
Acer rubrum, and var. *trilobum*
Amelanchier Wiegandii
A. laevis
Betula lutea
Crataegus ?chrysocarpa
C. ?succulenta var. *macracantha*
C. ?Douglasii

PLATE III



A. Cheminis Hill, near Arntfield, with mixed forest (trembling aspen predominant) at foot of rock face.

B. Sedimentary Palæozoic bed-rock in the Little Clay Belt of Ontario, near Englehart.

In this group are all the trees which have not been reported north of the Clay Belt. As would be expected in species reaching their northern limit of range within the northern margin of our region, none of these species are now common. Their geographical affinities are all temperate North American, most of them eastern American.

Rhus typhina
Populus grandidentata
Acer saccharum
A. saccharinum
Fraxinus pennsylvanica, represented by var. *Austini* and var. *subintegerrima*
Quercus macrocarpa
Q. rubra var. *borealis*
Prunus nigra
Acer pensylvanicum
Cornus alternifolia
Ostrya virginiana
Salix amygdaloides
Amelanchier arborea
Crataegus ?submollis

The above species are rare or uncommon and reach their northern limit in the Lake Timiskaming portion of the Clay Belt where the Great Lakes – St. Lawrence Forest Region (Halliday, 1937) extends into the glacial Lake Barlow-Ojibway basin. In contrast to the preceding groups, their geographical affinities are all with temperate, chiefly eastern, North America.

SALIX PENTANDRA
ACER NEGUNDO var. VIOLACEUM
PINUS SYLVESTRIS
SALIX FRAGILIS
S. ALBA var. VITELLINA
POPULUS sp.

None of these six introduced tree species is naturalized to any appreciable extent in the Clay Belt. SALIX PENTANDRA is the only common introduced tree.

Tsuga canadensis
Picea rubens
Juglans cinerea
Fagus grandifolia
Ulmus rubra
Rhus glabra
Fraxinus americana

The seven species listed above have not been found within our region. The possibilities of their occurrence are discussed later (*See* catalogue).

Thirty separate forest communities were studied in detail. These were selected, on the basis of our field experience, as representative of the whole forest and were large enough (one to two acres) to give a reasonably full idea of the composition of each kind of community. A list of all the species present was made for each plot with notes on their frequency and abundance. The notes on forest communities, which follow, were composed from the records of these samples, taken together with collecting records for all the plants treated in the annotated catalogue. For special aspects of the forest communities, the reader is referred to two papers on silvicultural characteristics (Millar, 1936, and Bonner, 1941) and studies of forest site and cover types in the growth and yield survey now in progress (MacLean and Bedell, 1955).

Black spruce forest

This is in every respect the most important forest community of the Clay Belt. A reasonable estimate would indicate that nearly three-quarters of our region is covered with predominantly black spruce forest.

PLATE IV

A. Old beach above present level of Lake Abitibi, Quebec.

B. High black spruce forest, winter road, and pulpwood railway, south of Kapuskasing.

About half of this is wet, boggy forest with mature trees up to 50 feet high. The other half, on better-drained sites, produces trees which occasionally attain 70 feet in height. There are, of course, many degrees of bogginess on the clay plain. On the best-drained upland sites, the black spruce forest grades into a mixed forest community whose composition will be discussed in a separate section. Two lists have been made to represent the predominantly black spruce forest communities; one for the low, boggy muskeg forest; the other for the taller, better-drained forest. It must be emphasized that this is an arbitrary division into two lists, based chiefly on bogginess. In the field there is no sharp boundary with respect to bogginess. However, the two lists that follow will serve to represent this important community more faithfully than one list for 'average' conditions.

Low, boggy, muskeg forest

Trees:

*[1]*Picea mariana*
Larix laricina

Undergrowth:

Carex gynocrates
**C. disperma*
**C. trisperma*
**Smilacina trifolia*
**Ledum groenlandicum*
**Kalmia angustifolia*
K. polifolia
**Chamaedaphne calyculata*
Gaultheria hispidula
**Oxycoccus quadripetalus*
Lonicera oblongifolia

These communities are poor in number of species (Plate V B). In addition to the 13 common species listed above, another 15 were noted as of occasional occurrence. This summary of species noted in the Clay Belt compares closely with lists for sample plots of black muskegs in the Moose River area of the Hudson Bay Lowland, studied by Hustich (1955).

High, better-drained forest

Trees:

Abies balsamea
**Picea mariana*
Larix laricina
Thuja occidentalis
Betula pumila var. *glandulifera*
Alnus rugosa var. *americana*

Undergrowth:

Equisetum sylvaticum
Dryopteris disjuncta
Carex gynocrates
**C. disperma*
C. trisperma
**C. brunnescens*
C. vaginata
Smilacina trifolia
Maianthemum canadense
**Anemone quinquefolia*
**Coptis groenlandica*
**Mitella nuda*
**Rubus pubescens*
Viola incognita
V. renifolia
**Cornus canadensis*
Pyrola secunda
P. minor
**Ledum groenlandicum*
Kalmia angustifolia
Chamaedaphne calyculata
**Gaultheria hispidula*
Trientalis borealis
Lonicera involucrata
Linnaea borealis
**Petasites palmatus*

[1]In this and all subsequent lists, species of primary importance are marked with an asterisk.

PLATE V

A. Open bog, north of New Liskeard. Leatherleaf (*Chamaedaphne calyculata*) is dominant species.

B. Low, boggy black spruce forest near Longlac.

In these richer communities (Plate IV B) another 21 species were noted as of occasional occurrence. This summary of species in the Clay Belt may also be compared with lists for mixed conifer forests in the Hudson Bay Lowland (Hustich, 1955).

Mixed forest

The black spruce forest, so characteristic of the Clay Belt, gives way to a mixed deciduous-coniferous forest on well-drained sites. This mixed forest is much more complex in species composition and reflects, often very locally, the effects of small changes in drainage, of fires, and of other disturbances. The following list gives the species that may be expected commonly in these communities on hills, slopes, high and dry shores, and well-drained sites generally (Plates I A, II A).

Trees:

**Abies balsamea*
**Picea glauca*
**P. mariana*
**Pinus Banksiana*
Thuja occidentalis
Salix Bebbiana
S. discolor
**Populus tremuloides*
P. balsamifera
**Betula papyrifera*
Alnus crispa
A. rugosa var. *americana*
Sorbus americana
S. decora
Amelanchier Wiegandii
A. laevis
Prunus pensylvanica
P. virginiana
Acer spicatum
A. rubrum (in southern part)

And in the Lake Timiskaming portion these communities include trees at their northern limit such as *Acer saccharum, A. saccharinum,* and other rarer species (*See* section on tree species above).

Undergrowth:

**Equisetum sylvaticum*
Lycopodium annotinum
L. clavatum
Osmunda Claytoniana
Dryopteris disjuncta
**D. spinulosa*
**Athyrium Filix-femina*
Poa saltuensis
Calamagrostis canadensis
Carex Peckii
C. deflexa
C. arctata
C. laxiflora
**Clintonia borealis*
**Maianthemum canadense*
Streptopus roseus
**Corylus cornuta*
Stellaria calycantha
Anemone quinquefolia
**Coptis groenlandica*
Actaea rubra
Mitella nuda
Ribes glandulosum
R. lacustre
R. triste
Amelanchier Bartramiana
Fragaria virginiana
**Rubus pubescens*
Rosa acicularis
Lathyrus ochroleucus
Viola renifolia
Epilobium angustifolium
**Aralia nudicaulis*
Cornus canadensis
Pyrola elliptica
P. asarifolia
Ledum groenlandicum
Gaultheria hispidula
**Vaccinium myrtilloides*
**V. angustifolium*
**Trientalis borealis*
Mertensia paniculata

Melampyrum lineare
Galium triflorum
**Diervilla Lonicera*
**Lonicera canadensis*
**Linnaea borealis*
Viburnum edule
Solidago macrophylla
**Aster macrophyllus*
A. ciliolatus
Petasites palmatus

To this long list, from the richest habitats of our region, could be added another 57 species of occasional occurrence. Over 80 species were recorded on a single sample community of mixed deciduous-evergreen forest at Cheminis near Arntfield, Quebec (Plate III A).

Jack pine forest

Jack pine forest on sandy land (Plate VI) comprises about 4 per cent of the total forest of the Clay Belt. Other tree species are here in a very secondary category.

Trees:

Picea glauca
P. mariana
**Pinus Banksiana*
Populus tremuloides
Betula papyrifera
Alnus crispa
Amelanchier Wiegandii
Sorbus decora
S. americana
Prunus pensylvanica

Undergrowth:

Lycopodium tristachyum
Pteridium aquilinum
Oryzopsis asperifolia
O. pungens
**Panicum lanuginosum*
Carex adusta
**C. tonsa*
C. Houghtonii
**Maianthemum canadense*
Cypripedium acaule
**Salix humilis*
Comptonia peregrina
Amelanchier humilis
A. stolonifera
A. Bartramiana
Potentilla tridentata
Rosa acicularis
Viola adunca
Cornus canadensis
**Ledum groenlandicum*
**Kalmia angustifolia*
Epigaea repens
Arctostaphylos Uva-ursi
**Vaccinium myrtilloides*
**Vaccinium angustifolium*
**Diervilla Lonicera*
**Linnaea borealis*
**Solidago hispida*

In addition to these 38 species, another 20 occur occasionally in this community.

There are a few openings in the sandy, jack pine forest where the sand has been eroded by the wind before the trees could become re-established following fire (Plate X B). A small number of species are found on these blow-outs, including some not seen, or uncommon, elsewhere:

Lycopodium sabinaefolium, and var. *sitchense*
L. tristachyum
Deschampsia flexuosa
Panicum depauperatum
Carex tonsa
Prunus susquehanae
Hudsonia tomentosa

White and red pine stands

White and red pine attain their northern limit (Haddow, 1948) close to the northern margin of our region. In the Lake Timiskaming portion of the Clay Belt considerable stands still remain. Local stories of pioneer days suggest that the pineries on Lake Timiskaming were on a grand scale before the heavy cutting at the peak of the lumber business in the Ottawa Valley. Logging was (1952) in operation in the vicinity of Timmins (Plate VII), but northward the stands are not large enough for special

PLATE VI

Jack pine forest, with thin covering of lichens on sandy floor, near Longlac.

commercial cutting. Occurring only on dry, often exposed and rocky sites, these pineries certainly would not now amount to so much as one per cent of the whole Clay Belt forest. They are of sufficient interest, particularly in the south of our region, to warrant a list of species. Of the tree species,

only balsam fir, white spruce, and white birch are of importance; the remainder are sporadic in occurrence and often marginal in the community.

Trees:

Abies balsamea
Picea glauca
**Pinus Strobus*
**P. resinosa*
Thuja occidentalis
Populus tremuloides
P. balsamifera
Betula papyrifera
Almus crispa
A. rugosa var. *americana*
Sorbus americana
S. decora
Prunus pensylvanica

And in the Lake Timiskaming portion of the Clay Belt: *Populus grandidentata* and *Quercus rubra* var. *borealis*.

Undergrowth:

Equisetum pratense
Lycopodium lucidulum
L. clavatum
**L. obscurum*
Dryopteris disjuncta
D. spinulosa
**Pteridium aquilinum*
Oryzopsis asperifolia
**Clintonia borealis*
**Maianthemum canadense*
**Corylus cornuta*
**Coptis groenlandica*
Amelanchier Bartramiana
Rubus idaeus var. *strigosus*
Viola renifolia
Epilobium angustifolium
**Aralia nudicaulis*
Cornus canadensis
Gaultheria procumbens
Arctostaphylos Uva-ursi
Vaccinium myrtilloides
**V. angustifolium*
**Trientalis borealis*
**Diervilla Lonicera*
**Linnaea borealis*
**Aster macrophyllus*

And another 36 species were listed in our records from these pineries.

Elm-ash woods

These are found on low, alluvial ground throughout the Clay Belt and northward beyond our region. They are such distinct communities (Plate VII) that they warrant a separate treatment, though their total area is certainly less than one per cent of the forest of the Clay Belt. Balsam poplar is usually associated with this community; the remaining tree species are very secondary.

Trees:

Abies balsamea
Populus balsamifera
Betula papyrifera
Almus rugosa var. *americana*
**Ulmus americana*
Prunus virginiana
Acer rubrum
A. spicatum
**Fraxinus nigra*

Undergrowth:

*Equisetum sylvaticum
*Pteretis pensylvanica
Poa palustris
Elymus virginicus
Carex Deweyana
C. debilis
C. leptonervia
C. intumescens
*Trillium cernuum
Urtica gracilis
Ranunculus abortivus
Thalictrum dioicum
Ribes triste
R. hirtellum
Impatiens capensis
Viola nephrophylla
*V. pensylvanica var. leiocarpa
Aralia nudicaulis
Sanicula marilandica
Osmorhiza Claytoni
Cornus stolonifera
Viburnum edule
Sambucus pubens

And in the Lake Timiskaming portion of the Clay Belt: *Arisaema atrorubens* and *Asarum canadense*.

Thickets

Some of the taller thicket-forming plants have already been noted in the list of tree species. These are species on the borderline between small trees and tall shrubs that sometimes attain tree stature but are frequently no taller than shrubs. Besides these alders, birches, and taller willows and serviceberries, the Clay Belt is rich in other species composing thickets. The commonest of these will now be considered in groups based on abundance, relationship, and habitat.

Willow thickets of considerable variety and extent occur throughout the Clay Belt along low shores of rivers and lakes, and in the frequent wet openings and clearings in the forest. Of the twenty willow species listed in the catalogue the commonest shore thicket plants are *Salix lucida*, *S. planifolia*, and *S. pellita* (Plate XI B). Two more species may be noted here, because they form small clumps of bushes in particular habitats: *S. pedicellaris* in boggy places and *S. humilis* in dry, sandy jack pine forest.

Another major thicket-forming species of our region is *Cornus stolonifera*, which occurs either in pure stands or mixed in the willow thicket communities in some wet habitats.

On open bog land, low dense thickets of *Chamaedaphne calyculata* occur in great abundance, frequently excluding all other species (Plate V A). Also widespread on bogs is *Ledum groenlandicum* which extends from open bog, through muskeg and the great black spruce forest of our region, to scattered occurrence in wet places in the mixed deciduous-coniferous forest. On the margins of floating bogs in small lakes (Plate XI A), *Andromeda glaucophylla* and *Kalmia polifolia* compose a distinctive low thicket. *Kalmia angustifolia* occurs in boggy land and again grows into higher thickets in openings in the sandy jack pine forest. Like *Salix pedicellaris*, *Lonicera villosa* commonly grows in small clumps of bushes around open boggy places.

A considerable number of species form smaller thickets of their own or occur mixed with other shrubs on banks of lakes, rivers, and creeks. The commonest of these are as follows:

Myrica Gale
Physocarpus opulifolius
Spiraea alba
Potentilla fruticosa
Rubus idaeus vars. *strigosus* and *canadensis*
Rosa acicularis
R. blanda
Ilex verticillata
Nemopanthus mucronata
Rhamnus alnifolia
Shepherdia canadensis
Vaccinium uliginosum
Symphoricarpos albus
Sambucus pubens

PLATE VII

Red (centre) and white (left) pine stand, southwest of Timmins, with lumber road.

In the forest there are scattered bushes, small thickets, and sometimes understories of the species listed below. Many of these spread and fruit

vigorously, especially *Vaccinium* spp. when released from cover by fire or clearing.

Comptonia peregrina
Corylus cornuta
Ribes hirtellum
R. lacustre
R. glandulosum
Rosa acicularis
Vaccinium myrtilloides
V. angustifolium
Lonicera hirsuta
Viburnum cassinoides
V. edule
V. trilobum

Serviceberries appear to have increased substantially with the opening up of the country by trails and clearings in the forest. Three species commonly occur in thickets in these habitats: *Amelanchier humilis*, *A. stolonifera*, and *A. Bartramiana*. Of the six other serviceberries in our flora, four are small trees and two are relatively infrequent shrubs.

Open Rocky Habitats

There are a small number of species characteristic of the rare rocky shores and open tops and flanks of the rock knobs which rise above the typical wet plain of the Clay Belt (Plates II A, III A, and XII A). None of these plants are frequent in our region, and one (*Scirpus Clintonii*) is very rare.

Selaginella rupestris
Woodsia ilvensis
Cystopteris fragilis
Polypodium virginianum
Juniperus communis
Poa nemoralis
Trisetum spicatum
Danthonia spicata
Agrostis scabra
Muhlenbergia mexicana
Oryzopsis pungens
O. canadensis
Scirpus Clintonii
Carex aenea
Corydalis sempervirens
Saxifraga virginiensis
Potentilla tridentata
Geranium Bicknellii
Campanula rotundifolia
Aster ptarmicoides
Erigeron hyssopifolius
Antennaria canadensis

Bogs

Small open bogs are numerous in the Clay Belt. Most of these are in openings in the black spruce forest where the poor drainage conditions of our region are at their worst (Plate V B). Occasionally, large areas of open bog are found over the wet clay plain (Plate V A). Floating bogs usually occur on the margins of the small lakes (Plate XI) that flank eskers. These lakes are often paired as twin lakes on each side of the esker. Some of these lakes are isolated, and more are found scattered in the sandy outwash plains. Floating bogs also occur in ponds and small lakes on higher ground, but in our region they are much less numerous than in the surrounding Precambrian country, which was not covered by glacial Lake Barlow-Ojibway.

The plants of the bog communities are mostly the wide-ranging species of the muskegs and bogs that are so characteristic of the boreal forest

PLATE VIII

Elm-ash woods with ground cover of *Pteretis pensylvanica*, on Lake Timiskaming, Ontario.

region of Canada. Around the margins of the open bogs, and sometimes scattered across them, are stunted trees and thickets of the following:

Picea mariana
Larix laricina
Alnus rugosa var. *americana*
Betula pumila var. *glandulifera*

The commonest species of the open bogs are—

*Scheuchzeria palustris
Dulichium arundinaceum
*Eriophorum spissum
E. viridi-carinatum
E. angustifolium
E. virginicum
*Rhyncospora alba
Carex gynocrates
C. chordorrhiza
C. diandra
C. disperma
C. tenuiflora
C. canescens
C. brunnescens
C. leptalea
*C. limosa
C. paupercula
*Carex lasiocarpa
C. pauciflora
*C. oligosperma
*Smilacina trifolia
*Salix pedicellaris
Sarracenia purpurea
*Drosera rotundifolia
*Potentilla palustris
Rubus Chamaemorus
R. acaulis
Pyrus melanocarpa
Hypericum virginicum
*Viola pallens
*Ledum groenlandicum
Kalmia angustifolia
*K. polifolia
*Andromeda glaucophylla
*Chamaedaphne calyculata
Gaultheria hispidula
*Oxycoccus quadripetalus
Menyanthes trifoliata
Galium labradoricum
Lonicera villosa

and 24 other species of occasional or rarer occurrence.

Marshes, Meadows, and Shores

The plants of wet places, other than bogs, are placed in this section under four headings.

Marshes

There are few large marshes in the Clay Belt, but many small ones on low, wet shores (Plate IX B). The marsh plants are evidently a shifting population. This applies particularly to our flat region where a small change in water-level has such a large effect on drainage, this being reflected in a correspondingly large change in the vegetation.

Marsh plants of considerable frequency are listed below:

*Equisetum fluviatile
Typha latifolia
Sparganium eurycarpum
Alisma triviale
*Sagittaria latifolia
Phragmites communis
Phalaris arundinacea
*Eleocharis palustris
*Scirpus acutus
Carex aquatilis
C. retrorsa
*C. rostrata
*C. vesicaria
*Calla palustris
Acorus Calamus
Iris versicolor
Polygonum amphibium
Potentilla palustris
Lysimachia terrestris
L. thyrsiflora
L. ciliata
Menyanthes trifoliata
Scutellaria epilobiifolia
Campanula uliginosa

Sedge meadows

The Clay Belt is rich in sedges, and these frequently form meadows of remarkable variety in species composition. Sedges form small and large meadows in open habitats (Plate IX) varying from floating boggy (*Carex limosa* and *C. oligosperma*) to marshy (*C. rostrata* and *C. vesicaria*), to colonies on shores (*C. aquatilis* and *C. lenticularis*), and to the many wet ditches (*C. canescens*). The taller species give a distinctive appearance to much of the open, wet country. The most frequent and abundant species composing these highly variable communities are listed below:

Dulichium arundinaceum
Scirpus hudsoniana
Eriophorum angustifolium
Carex gynocrates
C. chordorrhiza
C. diandra
C. prairea
C. disperma
C. canescens
C. brunnescens
C. interior
C. Crawfordii
C. Bebbii
C. leptalea
C. aurea
C. aquatilis
C. lenticularis
C. stricta
C. Haydenii
C. limosa
C. lasiocarpa
C. flava
C. rostrata
C. oligosperma
C. vesicaria

Grass meadows

There are few grass meadows, though the number of grass species in our flora is large. The commonest species of these small, wet, grassy places are listed below:

Glyceria borealis
G. canadensis
G. striata
Poa palustris
Calamagrostis canadensis
Agrostis alba
Beckmannia syzigachne
Phalaris arundinacea

When the land is cleared and drained, our region grows splendid crops of hay. But these hay and pasture grasses are mostly introduced species which will be discussed under crop plants and clearings.

Open, silted shores and wet banks

These habitats are frequent and sometimes extensive on the lakes and rivers of the Clay Belt (Plate XIII A). The major rivers are subjected to the action of remarkably high spring floods. Large areas of clay, silt, and sand are exposed in summer. Smaller streams and lakes are shallow, and their silted shores, where sheltered from erosion, provide habitats rich in species. The same richness is found on open clay banks. Floods, shifting substrate, and invasion by thickets keep these habitats variable and temporary in species composition. Of the large number of species found in these places, the following are the most frequent and characteristic.

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PLATE IX

A. Sedge meadow with some willow bushes, surrounding small lake east of Kapuskasing.

B. Rich aquatic (*Potamogeton* spp.) and marsh vegetation (*Scirpus acutus*) on Lillabelle Lake near Cochrane.

Equisetum arvense
E. palustre
Sparganium chlorocarpum
Triglochin maritima
Eleocharis pauciflora
E. acicularis
Carex aurea
C. viridula
Eriocaulon septangulare
Juncus tenuis
J. Dudleyi
J. filiformis
J. brevicaudatus
J. alpinus
Sisyrinchium montanum
Habenaria hyperborea
Polygonum lapathifolium
Ranunculus reptans
R. septentrionalis
Rorippa islandica
Drosera intermedia
Parnassia palustris
Hypericum ellipticum
H. virginicum
Epilobium leptophyllum
Cicuta bulbifera
Sium suave
Primula mistassinica
Scutellaria epilobiifolia
Lycopus uniflorus
Mentha arvensis
Chelone glabra
Mimulus ringens
Veronica scutellata
Utricularia cornuta
Plantago major
Galium boreale
G. tinctorium
Lobelia Kalmii
L. Dortmanna
Solidago Purshii
S. graminifolia
Aster puniceus
A. simplex
Gnaphalium uliginosum
Bidens cernua
Senecio aureus

Aquatic Plants

The small, shallow lakes and slow-moving streams of the Clay Belt are rich in aquatic vegetation (Plate IX B). The floating leaves of *Nuphar variegatum* are abundant in most ponds, quiet bays, and slow streams through marshes. Seventeen species of *Potamogeton* occur, with *P. gramineus* probably the most frequent and abundant. The submersed state of *Eleocharis acicularis* forms great colonies on the clay bottoms of silted or sheltered waters. The list that follows gives the 25 commonest and most characteristic of the 65 species that compose the aquatic vegetation of our region.

Isoëtes muricata
Sparganium angustifolium
S. fluctuans
S. minimum
Potamogeton zosteriformis
P. pusillus
P. epihydrus
P. alpinus
P. gramineus
P. natans
P. Richardsonii
Najas flexilis
Eleocharis acicularis
Spirodela polyrhiza
Lemna trisulca
Polygonum amphibium
Nuphar microphyllum
N. variegatum
Nymphaea tetragona
Ranunculus trichophyllus
Callitriche palustris
Myriophyllum exalbescens
Hippuris vulgaris
Utricularia vulgaris
Megalodonta Beckii

PLATE X

A. Tall, mature stand of trembling aspen, with immature understory of white spruce, on shore of Lake Kapuskasing.

B. Blow-out in young jack pine forest on sand, east of Taschereau.

Of the remaining 40 species, four rare ones should be noted here. These are all at or near the northern or western limits of their ranges.

Elodea Nuttallii
Valisneria americana
Elatine minima
Nymphoides cordata

Openings, Clearings, and Farmlands

The settlement of the Clay Belt within the last generation has opened up the country with many clearings and a system of railways, roads, and trails. Although a large proportion of the forest is old and undisturbed, the extent of mining, farming, railway, forestry, and road building operations is growing. Man-made forest fires have been the usual accompaniment of such developments. Natural openings are found rarely on rocky hills and shores. However, by natural factors such as fire (those set by lightning (Plate XVII), windthrow (Plate XII B), and flooding (including that from beaver dams, Plate XV A), the country is temporarily opened up, sometimes on a large scale, until the forest is regenerated or reinvades the disturbed area.

Along the frequent trails of our region, the plants suppressed by forest cover are released to flourish vigorously. These openings and marginal habitats provide especially rewarding places for plant collecting. All stages in the succession are at hand, from freshly cleared, cut-over, and fire-swept lands, which are quickly invaded by native plants and weeds, through various stages in the reversion to forest, up to mature second-growth stands with diminished numbers of species. Hustich (1957) has recently discussed the inception of apophytism in the subarctic Hudson Bay Lowland north of the Clay Belt.

Following fire there is a great growth of such plants as fireweed (*Epilobium angustifolium*), blueberries (*Vaccinium myrtilloides* and *V. angustifolium*), and frequently pin cherry (*Prunus pensylvanica*), before the willows (chiefly *Salix Bebbiana*), poplars, and birches take over, following propagation by wind-carried seeds. The kind of vegetation on these brûlés is highly variable depending on the severity of the fire and, correspondingly, the number of forest plants that survive.

In dry clearings on well-drained or shallow soils, the following plants occur frequently. This list includes some common introduced species. Occasional occurrences of species from the drier forest (discussed in the section on Forests) are here omitted.

Pteridium aquilinum
Bromus ciliatus
Festuca rubra
Poa compressa
P. pratensis
Agropyron trachycaulum
Hordeum jubatum
Calamagrostis inexpansa
Agrostis scabra
Phleum pratense
Carex projecta
C. Crawfordii
C. aenea
C. Houghtonii
Maianthemum canadense
Salix Bebbiana
Rumex Acetosella
Polygonum cilinode
Potentilla norvegica
Rubus idaeus vars.
Prunus pensylvanicum
Geranium Bicknellii

PLATE XI

A. Floating bog on pothole lake, south of Matheson. Forest of trembling aspen and black spruce.

B. Willow thickets on shore of lake, north of Amos, composed chiefly of *Salix pellita*, *S. lucida*, and *S. planifolia*.

Epilobium angustifolium
Aralia hispida
Cornus canadensis
Vaccinium myrtilloides
V. angustifolium
Apocynum androsaemifolium
Diervilla Lonicera
Erigeron philadelphicus
E. strigosus
ACHILLEA MILLEFOLIUM
HIERACIUM AURANTIACUM

In wet clearings there are sometimes large colonies of such plants as—

Polygonum lapathifolium
Ranunculus pensylvanicus
Epilobium glandulosum
Heracleum maximum

and many of the plants of marshes and wet meadows that have been discussed under those headings.

Turning now to the farmlands, we find that of the 475,000 acres reported as cleared for farming (Ontario and Quebec agricultural statistics, 1954), about 350,000 acres are in hay and pasture. Dr. M. R. Wiancko of the Experimental Station, Kapuskasing, very kindly checked and noted lists from our field notes on the frequency and abundance of some of the more common grasses and clovers of the farmlands. From these records, the following plants have the highest frequency rating in the pastures and hayfields of our area:

POA PRATENSIS
PHLEUM PRATENSE
TRIFOLIUM PRATENSE
T. HYBRIDUM

The following species are of secondary importance:

BROMUS INERMIS
FESTUCA RUBRA
F. ELATIOR
POA COMPRESSA
DACTYLIS GLOMERATA
AGROPYRON REPENS
Agrostis alba
TRIFOLIUM REPENS
MEDICAGO SATIVA

On the remainder of the cleared farmland, the chief crops are as follows:

	Acres
Oats	90,000
Mixed grains	20,000
Barley	6,000
Potatoes	5,000
Wheat	3,000
Rye	1,000

There are also minor crops of peas, turnips, buckwheat, corn, flax, and timothy seed. The figures given above are only approximations since the political boundaries (Timiskaming and Cochrane districts, Ontario; Temiscamingue County and Abitibi County and Territory, Quebec), which are the basis of statistical reporting, are arbitrary and do not conform with the natural boundaries of the Clay Belt, although they do include most of the farmlands.

The most frequent weeds in the pasture lands of our area are as follows:

RANUNCULUS ACRIS—buttercup
VICIA CRACCA—tufted vetch
CHRYSANTHEMUM LEUCANTHEMUM—ox-eye daisy
CIRSIUM ARVENSE—Canada thistle
TARAXACUM OFFICINALE—dandelion

On cultivated ground the worst weedy reputation is held by perennial sow thistle, SONCHUS ARVENSIS. On disturbed waste land the commonest introduced weeds are

POLYGONUM AVICULARE—knotgrass
CHENOPODIUM ALBUM—lamb's quarters
LEPIDIUM DENSIFLORUM—common peppergrass
CAPSELLA BURSA-PASTORIS—shepherd's purse
ERYSIMUM CHEIRANTHOIDES—wormseed mustard

FACTORS

The work of the various factors affecting the vegetation of the Clay Belt is mentioned elsewhere in many different contexts where appropriate. In this section the chief factors will be reviewed in their particular application to our region.

DRAINAGE

Viewed from the air, the major pattern of vegetation in our area reflects drainage conditions. The hills, slopes, higher banks of rivers and lakes, and better-drained sites generally, are covered by the mixed deciduous-evergreen forest. The porous soils of sandy areas support jack pine forests. The characteristic poorly drained clay plain is covered with the predominant black spruce forest. The reflection of the sun from standing water can be seen when flying over the forest, until late in the season. The taller black spruce forest gives way to low muskeg forest and finally open bog in the most poorly drained depressions. Marsh and aquatic vegetation have their places on lakes and river expanses, which are fewer and shallower than in the surrounding Precambrian country. Air views also retell the story of settlement developing along the waterways in the days of the fur trade and the first farming, then stretching out by trails, railways, and roads to logging, mining, and pulpwood operations.

Generally, poor drainage is therefore the paramount factor in the Clay Belt vegetation. Acid conditions of the topsoil, arising from poor drainage, act as a selective factor by limiting the vegetation to those species which can endure such edaphic conditions. The composition, growth, and yield of the forest have thus been analysed (MacLean and Bedell, 1955) on a physiographic site classification based on moisture and permeability (Hills, 1952). The development of the podsolic soils under the black spruce forest is closely related to these drainage conditions, combined with the short growing season and the cold climate. Hutchinson (1918) found evidence that the deciduous forests south of our region lag behind while awaiting further development of the soils.

PLATE XII

A. Exposed rocky habitat with small black spruce on summit of Mt. Laurier overlooking Lake Mattagami, Quebec.

B. Opening caused by wind in high black spruce forest, north of Lake Abitibi, Ontario.

PLATE XIII

A. Silted shore of Harricanaw River, near Amos, at low summer level (August 9, 1953). *Eleocharis palustris* is dominant on this mudflat. Burning peat and slash on farmlands made constant smoky haze in this dry season.

B. Two years after severe fire in high black spruce forest, north of Lake Abitibi, Ontario.

the temperature efficiency index is less than 32, it controls the climate." This consideration applies to the Great Clay Belt wherein the T-E index is 30.6 in the Northern Clay Forest Section (Halliday, 1937). Again, "if the index is more than 32, the climate is controlled by precipitation effectiveness." This applies to the Little Clay Belt with T-E index of 35.5 in the Haileybury Forest Section.

Competition

The closed vegetation of the Clay Belt shows everywhere evidence of competition between individuals of the same species and between different species. The common plants of our flora are vigorous and variable species, capable of filling nearly every niche of habitat. Success or failure in this competition, based on differing ecological requirements, is an important factor in the composition of the vegetation of our area.

In our floristic studies we noted the changing composition of the undergrowth of the forests as the even-aged stands matured. So varied are the conditions following fire or other disturbances that it is difficult to give a generally true picture of what happens in the succession. Common species of forbs were recorded as suppressed and non-fruiting in the forest, then flourishing amazingly when released from cover by the opening or clearing of the forest.

Clarification of this factor must await the results of long term ecological studies such as those proposed for the Great Lakes forests of Ontario by Maycock (1956).

Maturation

The dominant tree species themselves undergo further changes which affect forest composition because of their different maturation rates. This is especially apparent in the mixed deciduous-evergreen forest. The age suitable for cropping merchantable trees is usually considerably less than the life span of the species. Nevertheless, suggested rotation ages for Crown land forests of Northern Ontario (Forest resources inventory, 1953) will give an indication of these differences in maturing:

	Years
Abies balsamea	90
Picea glauca	100
P. mariana	120
Larix laricina	100
Pinus Strobus	120
P. resinosa	100
P. Banksiana	70
Thuja occidentalis	200
Populus spp.	50
Betula papyrifera	80

It should be noted that the rotation age suggested for *Picea mariana* in this list would seem to apply only to the wettest, slow-growing sites. A more truly comparable age would be 80 to 90 years for the most productive sites where black spruce attains highest frequency and abundance in the Clay Belt (MacLean, 1957).

The difference in rates of maturation between the trees of our forest communities is therefore another factor in the composition of the vegetation. This applies with special force to the Clay Belt forest of even-aged stands dating from the same disturbance (mostly fire in the past, and pulpwood cutting in increasing measure at present). Stands of what the foresters call "over mature" forest show interesting changes in composition as the original trees, dating from the disturbance, die out at different times. Then another disturbance occurs and succession starts again, rarely from a pioneer stage, usually with varying amounts of vegetation surviving and starting advance growth.

Migration

It is evident that the former vegetation of the Clay Belt was entirely destroyed in glacial times. Following the retreat of the glacier, the land surface was covered by fresh water dammed by the ice front. Since the drainage of glacial Lake Barlow-Ojibway there has been a period of possibly 6,000 (Karlstrom, 1956) or 10,000 years (Antevs, 1953), for

Plate XIV

Island in Lake Hébécourt, near Duparquet, with spruce on northwest side and poplar on southeast side.

the migration of species into what was the glacial lake basin. It is not practical to attempt to picture how migration took place in our region until more is known of its post-glacial geology. Climatic changes in the post-lacustrine period have possibly been great and probably fluctuating. There were doubtless several historical factors affecting the ecesis of the present flora.

PLATE XV

A. Flooding by beaver dam, north of Hearst, June 2, 1954.

B. Deformed, bushy branches caused by dwarf mistletoe (*Arceuthobium pusillum*) parasitic on black spruce, south of Senneterre.

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amount of flooding produced from one small dam is remarkable (Plate XV A). The beaver population was reduced in the days of the fur trade, which in our region was active in the period 1670 to 1870. This must have had far-reaching consequences in the vegetation. Beavers are now numerous again and affect the vegetation, not only by their dams, but also directly by feeding.

There is evidence everywhere in the Clay Belt of additional biotic factors, such as the browsing of moose, varying hare, muskrat, mice and their allies, and to a lesser extent porcupine, deer, and other mammals. There are also indirect effects through the food chains of various mammals, e.g., the taking of spruce sawfly by shrews. It is interesting to note evidence of a change in populations of the larger mammals (Snyder, 1928). Local residents reported to Snyder that woodland caribou wintered regularly at Lake Abitibi until about 1921: the first moose (now so plentiful) was killed about 1875; the first of the less common white-tailed deer was seen in 1906. According to Snyder the spread of the deer in this area may be associated with forest fires of 1911 and 1916, which provided second-growth forage.

Diseases

The effect of forest tree diseases is sometimes very striking in the Clay Belt. The Federal and Provincial Governments co-operate in supporting the investigations of forest insect rangers who are posted in each forest district. The most spectacular and disagreeable epidemics are the periodic infestations of the forest tent caterpillar. In 1952 there was widespread defoliation of deciduous trees and shrubs in our area (Plate XVI). This is certainly a considerable factor in opening up the forest, with corresponding effects on competition in the undergrowth and species composition of the stands.

Likewise, larch sawfly had a devastating effect in the early 1900's on the proportion of *Larix laricina* in the muskeg forest. Larch has been subjected to repeated attacks thereafter. These epidemics were sufficiently severe to change the muskeg forest from a black spruce–larch mixture to a predominantly black spruce forest, according to Sharpe and Brodie (1930).

Infestation by spruce budworm is periodically severe in our area, and *Abies balsamea* is even more subject to this than *Picea* spp. From tree ring studies, Blais (1954) dated infestations of spruce budworm in the Lac Seul area (west of the Clay Belt) to the 1866–1871 period, with recurrences. He noted that all or nearly all balsam fir trees of merchantable size were killed in recent outbreaks. It appears that these recurrent infestations are phases in the natural cycle of events associated with the maturation of balsam fir.

Forest tent caterpillars, larch sawfly, and spruce budworm are probably the three most important forest pests. To the damage done by them must be added the damage caused by fungus. Of particular interest to the botanist are the parasitic attacks of dwarf mistletoe (*Arceuthobium pusillum*) (Plate XV B). Two large areas were noted in both the Quebec and Ontario portions of the Clay Belt, and many other incidences were probably overlooked.

Settlement and Industry

Major disturbance in the Clay Belt by the work of man is of recent date. Some tracts of country remote from settlement, particularly in the northeast, are still undisturbed. The pre-Columbian inhabitants were migrating Indian tribes of the eastern woodlands who lived by hunting and fishing without agriculture (Jenness, 1955). This economy would not

Plate XVI

Defoliation caused by forest tent caterpillar of young poplar, with understory of balsam fir and spruce, at La Ferme, near Amos, July 6, 1952.

have supported a large population. The present-day Indian Reserve census (1,670 persons in 1951) can only be a rough indication of its former size.

The coming of the fur traders began the reduction of the beaver population with effects on the drainage of the country noted in the preceding section. The Hudson's Bay Company's first posts at the foot of James Bay in 1670 probably got some of the beaver fur trade from our

region by way of the north-flowing rivers. On the southern margin, in the Ottawa River system, the French régime, which occupied Timiskaming in 1671, built a fur trade post on Lake Timiskaming in 1679 (Chenier, 1937). Rivalry between British and French interests prompted an overland military expedition, led by le Chevalier de Troyes. This force passed through our region in 1686 incidently exploring an occurrence of lead ore on Lake Timiskaming. In 1785 the Northwest Company, based at Montreal, established the "Old Fort" on Lake Timiskaming, whose ruins are the oldest monument of settlement in the Clay Belt. Upon amalgamation of the rival companies, this became a Hudson's Bay Company post in 1821. Fur-trading operations were transferred in 1886 following the beginning of lumbering and farming.

Settlers arrived in the Lake Timiskaming portion of the Clay Belt in 1866. Timber merchants began cutting pine in this area about 1874, and it became the northernmost part of the great lumber business which was then flourishing in the Ottawa Valley. The community of Ville Marie was founded in 1879. The first steamboat operated on Lake Timiskaming in 1882. Farmers began to move into this southern portion of our region about 1883. They introduced the important factor of horse and cattle grazing in the surrounding woodlands. The farmers of the Little Clay Belt achieved success under conditions not unlike those they knew in their home farms of southern Ontario and Quebec. In 1893 the Canadian Pacific Railway started a branch from the main transcontinental line at Mattawa to Timiskaming on the Ottawa River, south of the Clay Belt. This branch was extended in 1922 into the Clay Belt at Ville Marie, which already had 20 years of indirect service by the Timiskaming and Northern Ontario Railway on the west side of Lake Timiskaming at Haileybury.

The Timiskaming and Northern Ontario Railway (recently renamed the Ontario Northland Railway) was the pioneer railroad within our region. It started northward in 1902 from the transcontinental railways at North Bay toward the new farmlands of the Little Clay Belt. It was later extended northward through our region, finally reaching the foot of James Bay in 1932. During railway construction, the discovery of rich silver deposits at Cobalt in 1903 began the exploitation of the mineral deposits in the Precambrian rocks that underlie the glacial till and lacustrine clay of our region. The appearance of the country changed rapidly as prospecting, construction, mining, milling, and smelting cut into the forest directly, or indirectly by the forest fires that occurred at this settlement. Greater mineral discoveries followed the first, north and west into the Ontario portion, and north and east into the Quebec portion of the Clay Belt. Discoveries of silver, gold, copper, zinc, and other metals, as well as asbestos, led to many enterprises, small and large. The production of all these mines makes the Clay Belt one of the most important mining areas of Canada. In the 1951 census the most populous places in our region were the mining centres at Timmins (population 28,000), Kirkland Lake (18,000), Rouyn-Noranda (24,000), and Val d'Or-Bourlamaque (13,000).

The pioneer railroad reached Cochrane in 1908, and the northern transcontinental line (now part of the Canadian National Railway system) joined it there in 1912, thus opening up the Great Clay Belt for the farming settlement that followed. By 1951, the majority (39,000) was settled in the Abitibi District of Quebec. The earliest farming centre,

Ville Marie on Lake Timiskaming, had grown slowly to 1,316 persons; New Liskeard, serving the farming community of the Little Clay Belt, had 4,215 people; the new farming centre of Amos had a population of 4,265. The Federal Government established experimental farms near Kapuskasing, Amos (later becoming an agricultural school), and Macamic; the Ontario Government Experimental Farm is at New Liskeard.

PLATE XVII

Old, dead tree, struck by lightning, at Long Pt. on Lake Abitibi, Ontario.

Improved transportation opened up the northwestern part of the Clay Belt (*See* Map 2) for the development of the pulp and paper industry. Draining into the upper Ottawa River system, the southern part of our region was already organized for lumber drives so that pulpwood took the same direction to paper mills south of our area. North of the watershed the rivers were dammed to provide the large amounts of power required for the paper mills established at Iroquois Falls, Smooth Rock Falls, and

Table 5. Growth of Population in the Clay Belt from the Ninth Census of Canada, 1951.

(Dominion Bureau of Statistics, 1953)

Census subdivisions	Census figures expressed in thousands									1951 Farming population	1951 Population density
	1871	1881	1891	1901	1911	1921	1931	1941	1951		
Témiscamingue Quebec	1	1	2	4	8	12	21	40	55	16	6.14
Timiskaming Ontario	.....	.....	.....	1	27	27	37	51	50	8	8.48
Abitibi Quebec	.....	.....	.....	2	2	15	24	68	86	39	1.13
Cochrane Ontario	.....	.....	.....	.....	12	26	58	81	84	12	1.61
TOTALS	1	1	2	8	49	80	139	239	275	74	

Kapuskasing (1928). At first this industry provided winter work and markets for the pulpwood cleared from the land of the pioneer farmers. There has been a shift to year-round woodland operations owing to the increasing importance of the industry and to the construction of roads for winter and summer hauling.

The first highway connecting our region with southern Canada was opened in 1927 (The Ferguson Highway of Ontario). The Quebec portion of the Great Clay Belt was connected later by a direct road southward from Senneterre. Access to much of the Clay Belt is now available by the linking of the network of farmland roads, of highways to the mining centres, and of new roads in the pulpwood limits. Part of the Trans-Canada Highway is being developed on the road system.

The impact of modern developments in farming, mining, and forestry is reflected in the census figures for our region (Dominion Bureau of Statistics, 1953). The Ninth Census of Canada, 1951, gives an idea of the increase in this factor of settlement. Table 5 summarizes the census figures for our area. It should be explained that the artificial census subdivisions do not conform precisely with the natural divisions of our region.

Only the most conspicuous factors at work on the vegetation of the Clay Belt have been noted above. There are many others effective in larger or smaller measure and at different times and places. When all can be considered, then a true conception of the development of the plant communities will emerge. From our observations and study we can conclude that this conception will require a dynamic explanation, because there is evidence of much instability in species composition of the forest stands. Any further generalizations have little value until studies of the maturation of the forest stands have been completed and measurements made of the effects of the various factors in our region.

PREVIOUS WORK

The first Clay Belt collection deposited in the National Herbarium consists of four weeds collected at Lake Timiskaming in 1872 by G. Richardson of the Geological Survey of Canada. Similar small collections were made later in the course of other duties by several officers of the Survey and the Museum. A few specimens were noted in the National Herbarium taken by J. M. Macoun in 1877 on the Missinaibi River, by R. Bell on the same river with doubtful date of 1878, by W. J. Wilson in 1901 on Lake Abitibi, by T. W. Waugh in 1916 on Long Lake, and by M. O. Malte in 1918 at Cochrane and Kapuskasing. W. R. Watson collected at least one specimen at Haileybury in 1922 when he was botanizing chiefly in the Temagami Forest Reserve at the southern margin of our area.

Collections totalling over 200 specimens were found at the University of Toronto Herbarium. These were made by G. Tunstell in 1910 near Lake Abitibi and in 1918 by T. W. Kirkconnell (1919) at Kapuskasing. A. L. Pritchard (1935) collected plants on Lake Abitibi in 1925 while engaged in fisheries research.

Before publication of his "Flore Laurentienne," Victorin (1935) collected in the Quebec portion of the Clay Belt. There are a few specimens

in the National Herbarium bearing his name, together with Germain and Meilleur, dated 1933. After construction of the northern road to Senneterre, Victorin made another excursion extending into the Clay Belt in 1941, accompanied by Germain, Dominique, and Blain (Victorin and Germain, 1942). Other collectors represented by a few specimens in the National Herbarium, or cited in our catalogue, are as follows: L. Fortier and E. Chauvet near Val d'Or, 1927; Cléonique-Joseph, Haileybury, 1938; J. Rousseau, upper Ottawa River, and at Duparquet with L. Empain and M. Noreau, 1940; Louis-Marie and G. Lamarre at several localities in Quebec, between 1940 and 1947; S. Baril, Lake Timiskaming and Amos, 1943; H. Latendresse, near Amos, 1952.

In their silvicultural studies, J. B. Millar (1936) and E. Bonner (1941) made a collection of 70 species near Kapuskasing in 1936. These specimens are in the care of the Woodlands Division of the Spruce Falls Power and Paper Company with a few duplicates at the National Herbarium, and more, probably from the same collection, at the University of Toronto.

Our region was visited in 1925 and 1938 in the course of the Canadian Weed Survey by H. Groh who made many sight records and collected a few specimens. These records were reinforced by the collections of C. Frankton in 1947, D. B. O. Savile in 1949, E. G. Anderson in 1952, and especially K. K. Bragg and J. J. Bassett in 1950 and later years. All this material is in the Herbarium of the Department of Agriculture, Ottawa (DAO).

In their trip down the Harricanaw River in 1946, Dutilly and Lepage (1952) started from Amos and traversed the northern boundary of the Quebec portion of the Clay Belt. They also studied *Elaeagnus* on Lake Timiskaming in 1954 and 1955. I. Hustich's collections from various places in northern Ontario and Quebec in 1946 and 1947 have been reported by Fagerström (1949). Two of these localities are at the margin of the Clay Belt: upper Mattagami R., south of Timmins; and near Abitibi R. (McInnis Siding), north of Cochrane. In 1952 Hustich also collected material from Carrière Rapid area on the Ottawa R. south of Val d'Or, and from Cedar Rapids on the Bell R., north of Senneterre.

COLLECTING LOCALITIES

In the list which follows, all collecting places of the three seasons of field work are arranged by province and county, district or territory. Labels on the specimens bear these place names as reference points to the localities where the collections were made. Most of the places are towns having post offices and railway stations, which can be found on small scale maps and gazetteers. The remainder are large natural features, lakes or rivers, also marked on most maps. All these places are marked on Map 2, using the abbreviations listed below in order to save space in the catalogue. Township names are much used in the Clay Belt by mining companies in locating claims, by foresters in describing timber limits, and by farmers and settlers in colonization. The usual abbreviation Twp. is used with the township named. Approximate latitudes and longitudes are given for each place.

Southern Portion

(The L. Timiskaming area including "The Little Clay Belt" of Ontario.)

QUEBEC: Timiskaming County

LTQ. = Lake Timiskaming, Quebec. About lat. 47° 22′ N., long. 79° 30′ W.

Collections were made on the east shore of this long narrow lake at Baie des Pères, near Ville Marie, and 6 miles northwest at Ile du Collège. September 10 to 14, 1952; June 5 to 9, July 24, and August 1, 1953. 15 localities.

VM. = Ville Marie. Lat. 47° 20′ N., long. 79° 26′ W.

The vicinity of Lac Laperrière, Baie Laperrière, and the old Fort Timiskaming, 2 to 3 miles south of the town, was the best collecting ground. Trips extended 8 miles south of Baie d'Africain and about 17 miles northeast to Angliers and Latulipe around Lac des Quinze. September 10 to 14, 1952; June 7 and 8 and July 24, 1953; July 19 to 22, 1954. 19 localities.

ONTARIO: Timiskaming District

LTO. = Lake Timiskaming, Ontario. About lat. 47° 28′ N., long. 79° 37′ W.

The limestone ridge of "The Little Clay Belt" reaches the north end of the lake at Dawson Point where most of these collections were made between Sutton Bay and Wabi Bay. The west shore of the lake was followed at Martineau Bay, Mission Point, and Maidens down to the outlet of the Montreal River. June 12, 1952; July 21 to 31, 1953; May 27 and 28, 1954. 13 localities.

Hail. = Haileybury. Lat. 47° 27′ N., long. 79° 38′ W.

At about 22 miles southeast of the town there is a small gorge, The Notch, on the Montreal River near its outlet on Lake Timiskaming. All these collections were made in this locality. July 31, 1953; May 30, 1954.

NL. = New Liskeard. Lat. 47° 31′ N., long. 79° 41′ W.

The main base for our work in the Lake Timiskaming portion of the Clay Belt was the Ontario Experimental Farm at the northern outskirts of New Liskeard. From this camp we collected by means of the farming country roads, east 3 miles in Harris Twp., 8 miles to the Blanche River, and 15 miles to Brethour Twp.; north through Harley, Hilliard, and Pense Twps. and about 22 miles to the least disturbed place in the Little Clay Belt, the ravine of the Englehart River; northwest through Henwood Twp., past the high falls of the Englehart River to Charlton and Robillard Twps., 35 miles to Elk Lake; west through Dymond Twp., about 8 miles into Hudson and Harley Twps. June 11 to 17, 1952; July 21 to 29, 1953; May 27 to 29, 1954. 42 localities.

Northern Portion

(The "Great Clay Belt" extending westward from the Chibougamau River in Quebec, long. 75° 30′ W., to the Ogoki River in Ontario, long. 88° 30′ W.)

QUEBEC: Rouyn—Noranda County

Arnt. = Arntfield. Lat. 48° 12′ N., long. 79° 15′ W.

The main collecting place was Cheminis Hill, a remarkable landmark 12 miles west of the town. We also collected on the shore of Opasatica Lake, 7 miles south, and in Montbeillard Twp. June 20 to 21, 1952. 6 localities.

VdO. = Val d'Or. Lat. 48° 06′ N., long. 77° 47′ W.

The townsite is in East Abitibi County close to the southern boundary. A forestry road extends 23 miles southwest to Carrière Bay on the Ottawa River in Jourdan Twp. where these collections were made. July 10, 1952. 2 localities.

QUEBEC: Timiskaming County

OttR. = Ottawa River. Lat. 47° 48′ N., long. 77° 28′ W.

Our base was a depot camp of the Canadian International Paper Company at Lake Granet on the Ottawa River. Collections were made in the vicinity of Lake Granet and around the northeast bay of Grand Lake Victoria. July 11 to 15, 1954. 6 localities.

QUEBEC: West Abitibi County

LaS. = La Sarre. Lat. 48° 48′ N., long. 79° 13′ W.

Lake Abitibi, where we camped, lies 14 miles west of the town. We collected along the lake shore and into La Reine Twp. and at two small lakes, Lake La Sarre, 3 miles west, and Lake Bourbeau, 2 miles east of the townsite. June 25 to 29, 1952; July 17, 1954. 14 localities.

Dup. = Duparquet. Lat. 48° 30′ N., long. 79° 15′ W.

We collected around Lake Duparquet, one mile southwest of the townsite, 7 miles west at Lake Hébécourt, north about 10 miles along the Duparquet River to Rapide Danseur, Gallichan, and the outlet into Lake Abitibi, 13 miles northwest in Hébécourt Twp. and 4 miles northeast near Lake Dequisier. August 20 to 25, 1952. 18 localities.

Tas. = Taschereau. Lat. 48° 40′ N., long. 78° 42′ W.

The townsite is in East Abitibi County close to the western boundary. A road leads southwest to Proulx Mills on Lois Lake through Privat Twp. where we collected. August 29, 1952. 3 localities.

QUEBEC: East Abitibi County

Tas. = Taschereau, *see* above. Lat. 48° 40′ N., long. 78° 42′ W.

After collecting southeast of the town around Robertson Lake we camped 15 miles north at Chicobi Lake where the forest was relatively undisturbed. Collections were also made 7 miles east of town in Launay Twp., 17 miles east of Trécesson Twp., and, in two seasons, 16 miles northeast along the road from Villemontel to Lake Berry. August 26 to 31, 1952; August 7, 1953. 18 localities.

Amos. Lat. 48° 34′ N., long. 78° 07′ W.

The vicinity of Lake Beauchamp, 4 miles west of the town, around L'Ecole d'Agriculture at St. Viateur (La Ferme), and the neighbouring lakes Gauvin and Georges was a major collecting area in all three seasons. Excursions were made on the Harricanaw River through Amos; 20 miles southwest in Preissac Twp.; 5 miles south around Lake Figuery and 15 to 20 miles south in La Motte and Malartic Twps.; 18 to 25 miles southeast at Lake Roy and Lake Fiedmont; 17 miles northeast in Castagnier Twp.; and 10 miles northwest in Trécesson Twp. July 1 to 6, 1952; August 4 to 16, 1953; June 8 to 16, 1954. 45 localities.

VdO. = Val d'Or, *see* above. Lat. 48° 06′ N., long. 77° 47′ W.

Our camp and chief collecting area was at Lake Blouin, 2 miles north of the town. A forestry road was followed to Lake Lemoine, 5 miles southwest, and 8 miles south of town to lakes Dix and Simard. Collections were also made near East Sullivan Mine, 2 miles east, and in Senneville Twp., 9 miles northeast of Val d'Or. July 8 to 11, 1952; August 18 to 27, 1953. 14 localities.

Sen. = Senneterre. Lat. 48° 24′ N., long. 77° 14′ W.

Collections were made 11 to 22 miles south of town in Tiblemont, Pascalis, and Louvicourt Twps.; 20 miles north on Lake Parent; and about 40 miles north at Kiask Chute on the Bell River. September 3 to 7, 1952; August 25, 1953. 11 localities.

QUEBEC: Abitibi Territory

Tas. = Taschereau, *see* above. Lat. 48° 40′ N., long. 78° 42′ W.

By chartered aircraft we flew from a base at Lake Figuery, near Amos, to a small lake close to the Plamondon Hills about 34 miles north of Taschereau in Celeron Twp. about lat. 49° 07′ N., long. 78° 34′ W. June 10 to 13, 1954. 5 localities.

LWas. = Waswanipi Lake. Lat. 49° 39′ N., long. 76° 30′ W.

We reached the Hudson's Bay Company post at the north end of the lake by canoe, portaging from the furthest point of a new road near the O'Sullivan River and paddling down the river and across the lake. Collections were made within a 6-mile radius of the HBC post. June 26 to 29, 1954. 7 localities.

WasR. = Waswanipi River. About lat. 49° 52′ N., long. 77° 00′ to 15′ W.

Continuing canoe trip, we collected along the river from Lake Goeland to its outlet at the east end of Mattagami Lake. June 30 to July 3, 1954. 2 localities.

LMat. = Mattagami Lake. Lat. 49° 50′ N., long. 77° 32′ W.

The canoe journey was halted at the forestry camp on Dunlop Bay while we collected there and up to the fire-tower on the top of Mount Laurier, which is reputed to be the highest hill in the Clay Belt. July 4 to 6, 1954. 3 localities.

Michaud Twp.; 7 miles northeast to Painkiller Lake; and about 20 miles northwest on the road from Monteith to Iroquois Falls. July 12 to 19, August 19, 1952; June 19, September 1 to 3, 1953. 31 localities.

IF. = Iroquois Falls. Lat. 48° 46′ N., long. 80° 40′ W.

This is a pulp mill town and divisional headquarters of the Abitibi Power and Paper Company. Collections were made 2 miles east of town in Teefy Twp.; northwest 5 miles around Nellie Lake and 10 miles in Newmarket Twp.; 5 miles west in Calvert Twp. and 8 miles southwest in Clerque Twp. June 15 and July 9, 1953. 5 localities.

Tim. = Timmins, *see* above. Lat. 48° 28′ N., long. 81° 20′ W.

From a base at the forestry station on Porcupine Lake, 6 miles east of the city, excursions were made 8 miles east of Timmins to Bobs Lake, 10 miles to Pamour, and 20 miles to German Twp.; northeast 18 to 20 miles to Hoyle and Connaught, 20 to 25 miles in Little Twp., and 22 miles to the Frederick House River; in Timmins at the Mattagami River; 10 miles northwest in Jamieson Twp.; west 4 miles in Mountjoy Twp.; 8 miles in Godfrey Twp. and 20 miles to Dana Lake; 6 miles southwest in Bristol Twp.; and 5 miles southeast in Deloro Twp. August 15 to 18, 1952; June 11 to 22, Sept. 6, 1953. 24 localities.

LAO. = Lake Abitibi, Ontario. About lat. 48° 50′ N., long. 80° 00′ W.

From a camp on the lake shore in Quebec we paddled to the Ontario side of Kenosha Island on the provincial boundary. Next year we took the train from Cochrane on the Canadian National Railway, northern transcontinental line, to the forestry station at Lowbush, and worked from that base by boat around Lake Abitibi. By railway and road we collected inland 6 miles north into Steele Twp. and 15 miles north into Hepburn Twp. We reached Lightning Bay on the south shore by forestry plane from Cochrane. June 28, 1952; July 12 to 17, 1953. 13 localities.

Coch. = Cochrane. Lat. 49° 03′ N., long. 81° 02′ W.

An important rail and road centre and forestry headquarters from which we worked south 2 miles into Lamarche Twp. and 10 miles into Hanna Twp.; southwest 5 miles to Neelands Rapids on the Frederick House River; west 6 miles to Welsh Lake and 45 miles near Smooth Rock Falls on the Mattagami River; northwest 8 miles to the Buskegau River and 11 miles to Kennedy Lake; north 2 to 4 miles in Lillabelle Lake, 11 miles to the Long Sault Rapids of the Abitibi River and some rapids on the Frederick House River and 16 miles into Leitch Twp. July 19, August 7 to 13, 1952; July 7 to 12 and 19, 1953; August 18 and 19, 1954. 21 localities.

Kap. = Kapuskasing. Lat. 49° 24′ N., long. 82° 26′ W.

A major collecting area in all three seasons. From the Dominion Experimental Station we worked along the Kapuskasing River and its rapids near the town and 8 miles south to Big Beaver Falls; and in 1953 by barge and company railway to the Spruce Falls Power and Paper Company depot camp about 26 miles southwest in Shanly Twp. Working east by the Trans-Canada Highway we collected 13 miles southeast along the Chain-of-Lakes Road, 7 miles east in Fauquier Twp., 12 miles east at

Remi Lake, and 8 miles northeast in Gurney Twp. Working west by the Trans-Canada Highway we collected through Williamson and Idington Twps. to a point about 30 miles west in McCrea Twp. July 20 to 26, 1952; June 24 to July 5, 1953; August 5 to 9, 1954. 39 localities.

Hst. = Hearst. Lat. 49° 42′ N., long. 83° 40′ W.

Most collecting was done from the town westward along the Trans-Canada Highway at Forde Lake, Rabbit Lake, Shekak River, the deep ravine of the Nagagami River, and to a point 46 miles west in McMillan Twp. We collected north through Casgrain and Hanlan Twps. to Lake Ste. Thérèse, 8 miles from town; and east 18 miles to Mattice through Devitt Twp.; and about 18 miles northeast on the Mattawishkwia River. August 2 to 6, 1952; June 2 to 5 and August 9 and 10, 1954. 24 localities.

ONTARIO: Thunder Bay District

Long. = Longlac. Lat. 49° 47′ N., long. 86° 33′ W.

From an old depot camp of the Longlac Pulp and Paper Company on Lukinto Lake, 11 miles east of the townsite, we collected along the Trans-Canada Highway at Phipps Lake and on the Kenogami River at the eastern edge of the town. We collected 9 to 16 miles north in Bain and O'Meara Twps.; 17 miles west on Kenogamisis Lake and 60 miles east on the Pagwachuan River, July 28 to August 1, 1952. 12 localities.

Ger. = Geraldton. Lat. 49° 42′ N., long. 86° 52′ W.

From the forestry station on Kenogamisis Lake we collected locally and by forestry plane (courtesy of the Division of Air Service, Ontario Department of Lands and Forests) 13 miles east to Jackfish Bay on Long Lake and north 48 miles to O'Sullivan Lake, 64 miles to Melchett Lake, and 76 miles to Ogoki. August 11 to 13, 1954. 7 localities.

CATALOGUE

Foreword

Some explanations should be made in preface to the catalogue. The arrangement of taxa follows the order of Gray's Manual, eighth edition, 1950, with few exceptions. The status of each species, subspecies, variety, and form is indicated by the type of the heading: names of indigenous plants are printed in boldface, aliens in roman type.

Citations of specimens are given in order from south (the Lake Timiskaming portion including the "Little Clay Belt") to north (the "Great Clay Belt"), and from east (Quebec) to west (Ontario). Only a representative sample of our collections has been cited, except in critical species or varieties, where all are listed. To conserve time and space, relatively few collections were made of the common and best understood species, and correspondingly few have been cited in the catalogue.

Dates of flowering and fruiting are noted for most plants. In each case this phenological data is bracketed with the locality. This was done because our region is so large that the date of anthesis may differ by several days from south to north (roughly 150 miles) and from east to west (about 600 miles). According to Chapman's (1953) analyses, the growing season, on the average, begins and ends on April 25 and October 17 in the Little Clay Belt, and May 7 and October 8 in the Great Clay Belt. Preference was given to phenological records for 1952 in which the march of the season was closer to normal than in 1953 and 1954. For abundance and frequency of occurrence, the terms abundant, common, frequent, occasional, scarce, and rare have been used in their usual senses.

Collections from the nearest stations all around the Clay Belt are frequently mentioned in considering the possibilities of the occurrence of additional species within our region. This material is all in the National Herbarium, and much of it was never published. At Lake Nipigon, just a few miles south of the western extremity of our region, John Macoun collected a few specimens in 1884. The Temagami Forest Reserve adjoins the southwest margin of the Little Clay Belt. W. R. Watson collected in that Reserve in 1922. Five localities on the north shore of Lake Superior were botanized by field parties led by T. M. C. Taylor and R. C. Hosie. Two of these are close to the southern margin of our region at Schreiber (lat. 48° 45′ N., long. 87° 15′ W.), Hosie *et al.*, 1937; and at Peninsula (lat. 48° 45′ N., long. 86° 15′ W.), Taylor *et al.*, 1939. Sibley Twp. lies about 100 miles southwest of our region on Thunder Bay (lat. 48° 20′ N., long. 88° 55′ W.), Taylor *et al.*, 1936. About 50 miles south is Michipicoten (lat. 48° 00′ N., long. 85° 00′ W.), Hosie *et al.*, 1938, lying on the border of the Great Lakes–St. Lawrence Forest Region. Within that Forest Region lies Batchawana (lat. 47° 00′ N., long. 84° 45′ W.), Taylor *et al.*, 1935, located about 100 miles south of the Clay Belt (catalogue published, Taylor, 1938). Hustich (1955) collected about 45 miles northward at Renison on the Moose River (lat. 50° 58′ N. long. 81° 08′ W.) in 1946 and

1947, and about 60 miles eastward in the Lake Chibougamau area (lat. 49° 53′ N., long. 74° 22′ W.) in 1948. Fagerström (1949) also reports a collection by Hustich made in 1946 near the eastern margin of the Clay Belt at Oskelaneo. In 1952 Hustich collected at two localities just outside the margin of our region: Smoky Falls, north of Kapuskasing, and northeastward at Cooper Lake, an expansion of the Marten River tributary to the Rupert River.

Two published catalogues were also used for checking the northward occurrence of Clay Belt species. These are lists of plants collected on the Harricanaw River by Dutilly and Lepage (1952), and on the west side of James Bay by Dutilly, Lepage, and Duman (1954).

Many of the plants treated in the catalogue, which follows, are the highly variable species that constitute such a large proportion of the flora of the boreal forest. These present taxonomic problems, which are noted briefly in the text. By indicating the degree of doubt in certain cases the writer has tried to avoid giving the impression of greater knowledge or certitude than he actually has.

In general, the treatment of Fernald (1950) in Gray's Manual, eighth edition, and of Gleason (1952) in the new Britton and Brown, have been followed in the catalogue. Where these authorities differ, cross references are given. Many original taxonomic papers and monographs have been consulted. References to these are omitted, except in special cases, to avoid repetition of bibliographies readily available elsewhere.

Common names are given only for those species mentioned in *Native Trees of Canada* (1949), *Weeds of Canada* (1935), and the commonest agricultural plants.

Abbreviations

For abbreviated place names see the list of localities in preceding section.

Gray's Man. = Gray's Manual of Botany, eighth edition. M. L. Fernald (1950).

New B. & B. = The New Britton and Brown Illustrated Flora. H. A. Gleason (1952).

DLD = Contribution à la flore du versant occidental de la Baie James, Ontario. A. Dutilly, E. Lepage, and M. Duman (1954).

Taylor = A catalogue of vascular plants. T. M. C. Taylor, with Botanical investigations in Batchawana Bay region, Lake Superior, by R. C. Hosie (1938).

All specimens cited are in the National Herbarium of Canada unless otherwise noted. The only herbarium abbreviation used in this catalogue is DAO for the Department of Agriculture, Ottawa.

ANNOTATED LIST

EQUISETACEAE

Equisetum arvense L. Field Horsetail

NL. clay river-bank, No. 5341.

This specimen has an erect sterile stem, its numerous, whorled branches are simple and 4-angled with sheaths 4-toothed, placing it with the typical form in Gray's Man.

NL. roadside through dwarf birch thickets, No. 5306.

This material has the prostrate stem with upright branches of forma *diffusum* (A. A. Eat.) Clute.

NL. bank of deep clay ravine (shedding spores May 29, 1954), No. 5609; Amos, railway ditch through alder-willow thicket, No. 3012; Math. silted shore of small boggy lake, No. 3142.

These numbers represent by far the commonest variety of this species in the Clay Belt having the simple, 3-angled branches with 3-toothed sheaths of var. *boreale* (Bong.) Ledeb. The New B. & B. comments that this variety "has perhaps no taxonomic significance."

A frequent species throughout the Clay Belt on low wooded shores and in clearings and openings in the forest. Common on road embankments and railways. Forming large colonies on clay river-banks in the zone where they are affected by high spring flood waters.

Equisetum pratense Ehrh.

NL. clay bank of ravine in poplar-spruce woods, No. 2580; IF. clearing in aspen woods, heavy clay, No. 4781; Hst. thickets on river-bank, deep ravine, No. 3745.

Frequent in moist woods on clay soil and on river-banks and ravines, often with *E. arvense*. Not found fruiting.

Equisetum sylvaticum L.

VM. poplar woods, lake shore, No. 5976; IF. clearing in aspen poplar woods (shedding spores June 15, 1953), No. 4780; Kap. spruce-birch-poplar forest, No. 4985.

These numbers and all other collections from our region have the smooth branches of var. *pauciramosum* Milde. The branches are copiously forking, which is the key character for forma *multiramosum* Fern. This is the form more often represented according to Gray's Man., but it is not mentioned in the New B. & B.

One of the commonest plants of damp forest. Occurring also in large patches in wet openings and thickets.

Equisetum palustre L.

Three forms of this extremely variable species have been recognized in the Clay Belt material.

forma *verticillatum* Milde with long, whorled, simple branched ver strongly ascending: Arnt. lakeshore sandspit (fruiting June 21, 1952), No 4650; LAO. sandbar, No. 5543.

forma *arcuatum* Milde with branches subhorizontally spreading: Mat marshy shore of pond (fruiting July 16, 1952), No. 3194; Amos, marsh o river shore, No. 2972.

forma *simplex* Milde with few or no branches: NL. open alluvial shor No. 5301; LAO. sandbar (fruiting July 15, 1953), No. 5143; Amos, sandy lake shore, No. 2908.

Occasional on sandbars, wet shores, and marshes, where it sometim forms large colonies.

A specimen of an unbranched form of X *Equisetum litorale* Kuhlewein w collected west of our region on the Nipigon R. by John Macoun, July 4, 1884. Althou both of the supposed parents (*E. fluviatile* and *E. arvense*) of this possible hyb occur in the Clay Belt, it was not seen by us nor reported elsewhere near our area.

Equisetum fluviatile L.

The typical form with many whorls of branches is represented by th following: LaS. marsh (fruiting June 27, 1952), No. 2836; Amos, lake shor alder thicket, No. 5408.

Representative of intermediate forms with some branches or tuft are the following: LaS. black spruce bog, No. 5902; LWas. shallow wate in river delta (fruiting June 26, 1954), No. 5747.

The simplest extreme, forma *Linnaeanum* (Döll) Broun, is represente by the following: Arnt. lakeshore sandspit, No. 2783; Amos, silted clay lake shore, No. 5410; Kap. sedge marsh around small lake (fruiting Jun 28, 1953), No. 4936.

Large colonies of this species frequently develop on silted lake an rivershore marshes. It occurs occasionally in thickets, very wet black spruce woods and bogs. The forma *Linnaeanum* grows in the open, in deeper water.

The distinctive forma *polystachyum* (Brückn.)Broun with cones terminatin the strongly ascending branches was not observed in the Clay Belt, although i has been collected as close as Heron Bay, near Peninsula on L. Superior by Taylor Bannan & Harrison, No. 113.

Equisetum hyemale L.

E. hiemale var. *pseudohiemale*, New B. & B.

VM. gravelly spring-bank (fruiting June 7, 1953), No. 4708; Amos, sandy shore of small lake, No. 5461; Tim. steep, rocky river-bank, No. 4832; Kap. gravelly bank on shore of small lake, No. 6118.

All the Clay Belt material has the deciduous teeth of var. *affine* (Engelm.) A. A. Eat.

Occasional on open sandy and gravelly banks. Not reported north of our region.

The variety with persistent teeth, treated in Gray's Man. as var. *intermedium* A. A. Eat., was reported from Batchawana on L. Superior (as *E. laevigatum*) by Taylor.

Equisetum variegatum Schleich.

NL. open alluvial shore of Elk L., No. 5297; Kap. dominating small marsh in willow thicket (fruiting July 3, 1953), No. 4993; Long. wet silted lake shore, No. 3595.

Occurring rarely, in small colonies on open silted shores.

Equisetum scirpoides Michx.

VM. balsam fir – aspen poplar woods, No. 4726; Kap. muddy bank from spring to river, No. 3539; Long. moss-covered humus in black spruce forest (fruiting July 29, 1952), No. 3565.

Occasional on humus of wet coniferous and deciduous woods, hazel thickets, and around springs.

LYCOPODIACEAE

Lycopodium Selago L.

Tim. black spruce – aspen poplar woods around marshy lake, No. 4799.

This sterile specimen has the strongly divergent leaves characteristic of var. *patens* (Beauv.) Desv. The wet, wooded site differs from the "cold rocks and cliffs" of Gray's Man. and "rocks in acid soil" of the New B. & B., although both marshy and rocky habitats are described on the labels of the L. Superior collections of Taylor, Hosie, *et al.*

This eastern American variety of the arctic circumpolar species was found only once. It may have been passed by in mistake for the habitally similar, and frequently occurring, *L. lucidulum*. It was collected more frequently than the typical variety on the north shore of L. Superior by Taylor and Hosie parties. It has not been reported north of our region where the typical variety is common. Gray's Man. also adds Alaska to its range.

Lycopodium lucidulum Michx.

LL. wet poplar-spruce woods (fruiting June 19, 1952), No. 2709; Amos, damp trail through white spruce woods, No. 2921; Tas. black spruce woods on rocky hillside, No. 4251; LKap. aspen poplar woods, No. 6093.

The typical variety is frequent in the Clay Belt in damp woods particularly at the foot of slopes. Reported northward at Eastmain on James B. by Potter (1934).

Tas. wet black spruce woods, No. 4318; Coch. old black spruce forest (fruiting August 11, 1952), No. 3924.

These two specimens of var. *occidentale* (Clute) L. R. Wilson were distinctive in the field because of their finer habit with narrower and more attenuate, entire leaves.

Rare, much less frequent than the typical variety in our region.

Lycopodium inundatum L.

Amos, sandy lake shore (young sporangia July 3, 1952), No. 2947; IF. silted shore of small lake, No. 4787.

Locally abundant at two places close to water-level on open shores of small lakes. Not reported north of the Clay Belt.

Lycopodium annotinum L.

VdO. poplar-spruce woods, lake shore (shedding spores August 18, 1953), No. 5504; Tas. black spruce forest on rocky hillside, No. 4315; LL spruce poplar forest on rock outcrop, No. 2701.

The above specimens represent the typical form with coarse, lanceolate serrate leaves.

Common in moist woods and especially on damp, rocky hillsides.

NL. on sandy loam in jack pine forest, No. 2596; Amos, *Ledum-Sphagnum* bog (oldest strobile shedding spores July 1, 1952), No. 2897.

This material has the finer, linear, entire leaves of var. *acrifolium* Fern., which seems to prefer drier and more boggy sites in the Clay Belt.

The var. *pungens* (LaPylaie) Desv. with small ascending or appressed leaves has been collected a little south of the Clay Belt at Jackfish near Schreiber on L. Superior, Hosie, Losee & Bannan, No. 2; and frequently north of our area. It was not observed within our region, although suitable exposed rocky and peaty habitats are apparently available.

Lycopodium clavatum L.

VM. white spruce – birch woods, No. 5959; Sen. thickets on sandy river-bank (mature strobiles Sept. 4, 1952), No. 4371; Hst. black spruce – cedar woods, No. 3780.

These numbers and all other collections from the northern portion of our area have peduncles with 2 to 3 strobiles, placing them with the typical variety of Gray's Man., which includes var. *tristachyum* Hook. and vars. *laurentianum* and *subremotum* Vict.

Common in the drier forest throughout our region.

NL. sandy loam in jack pine forest, No. 2608.

This specimen has many young solitary strobiles and a few old strobiles 5 cm. long on peduncles 6 cm. long, and belongs to var. *megastachyon* Fern. & Bissell. It has a more crowded and intertwined branching habit than the typical form.

This variety was collected only once, in the L. Timiskaming portion of the Clay Belt.

The northern var. *monostachyon* Grev. & Hook. with short strobiles and peduncles was not observed in the Clay Belt, though we searched for it in exposed situations and on bleak hilltops.

Lycopodium obscurum L.

VM. white spruce – birch woods (fruiting July 20, 1954), No. 5960; Kap. white spruce-poplar woods, No. 3532; LAO. lakeshore birch woods, No. 5133.

The specimens in No. 5133 are intergradient with the following var. *dendroideum*.

LL. spruce-poplar woods, No. 2802.

This material has the compact habit of var. *dendroideum* (Michx.) DC. Eat. with branchlets terete and leaves uniformly spreading in all planes.

This species is common in woodlands and clearings preferring better-drained sites opened by the presence of deciduous trees.

Lycopodium sabinaefolium Willd.

Tas. sandy, open jack pine forest (strobiles shedding spores August 28, 1952), No. 4263, and sand blowout in jack pine forest, No. 4323.

This material belongs to the typical variety, having flattened branches with 4-ranked, short-tipped leaves.

A rare plant, collected only in the sand plain and esker near Taschereau in open jack pine forest.

LL. sandy jack pine forest, No. 2806; Amos, in same habitat, No. 2917; Math. sandy opening in jack pine forest (strobiles shedding spores July 18, 1952), No. 3286.

The above series has the terete branches, 5-ranked, long-tipped leaves of var. *sitchense* (Rupr.) Fern., which is maintained as a separate species in the New B. & B.

This variety occurs occasionally in the Clay Belt as a characteristic plant of sandy, open jack pine forest. The range of this species and variety extends north beyond our region.

Lycopodium complanatum L.

LL. rock outcrop above alder thicket, No. 2757; Amos, rock exposure in young birch wood (strobiles shedding spores August 10, 1953), No. 5463; LAO. dry spruce-poplar forest, No. 2855.

These collections have stems with sprawling, remotely forking branches showing annual constrictions, and bearing 1 to 2 strobiles, placing them with the typical variety of Gray's Man. which includes vars. *canadense* and *elongatum* Viet.

NL. on sandy loam in jack pine forest, No. 2597; Long. open jack pine – lichen forest (fruiting July 31, 1952), No. 3668.

These two collections have stems with uniform, fan-shaped branches without annual constrictions, and with 2, 3, or 7 strobiles, placing them with var. *flabelliforme* Fern.

LAO. spruce-birch forest on rocky hilltop, No. 5099; and dry spruce-poplar forest, No. 4651; Hst. floor of deep valley in moraine, No. 3761.

These collections are intermediates and mixtures of the head form and the var. *flabelliforme* supporting the statement in Gray's Man. that they pass directly into one another.

A frequent species in dry woods especially on the flanks of rocky outcrops.

Lycopodium tristachyum Pursh

Amos, on sand, in jack pine forest, No. 2919; Tas. dry sandy opening in jack pine forest (strobiles mature August 29, 1952), No. 4280; Math.

on sand, burned jack pine forest, No. 3213; Tim. dry sandy opening in jack pine forest, No. 4047; LL. sandy clearing in jack pine forest, No. 2803.

Occasional; a characteristic species of the sandy jack pine forest of the Clay Belt. Preferring openings where it forms colonies by its creeping stem, deep in the ground, dominating these inhospitable sites. Not reported northward.

SELAGINELLACEAE

The wide-ranging forest species *Selaginella Selaginoides* (L.) Link occurs all around the Clay Belt (*See* map in Raup, 1947). The closest record is that from L. Nipigon, Ontario, by John Macoun, July 14, 1884, and there is a large series of collections from the north shore of L. Superior by Taylor, Hosie, *et al.* Although we hunted for it unsuccessfully in suitable wet places, it probably will be found within the Clay Belt.

The more southern *S. apoda* (L.) Spring has been collected in southern Ontario and Quebec and once as far north as Michipicoten Harbour on L. Superior by Hosie, Harrison & Hughes, No. 1. This species may possibly occur around L. Timiskaming in the southern portion of the Clay Belt, though our searches in that area were unsuccessful.

Selaginella rupestris (L.) Spring

LTQ. rocky lake shore, No. 4485; Dup. bare rock outcrop above river, No. 4122; LL. bare granite outcrop, No. 2722; Kap. bare rock shelf above river, No. 3554.

Occasional, on bare rock outcrops and shores; forming extensive colonies on these dry, open sites. Not reported northward.

ISOËTACEAE

Isoëtes muricata Dur.

I. echinospora var. *Braunii,* New B. & B.

Sen. submersed, silted margin of small sandy lake, No. 4328; Amos, in 9 inches of water, sandy bottom, No. 5465; Tas. silted bay of sandy lake, No. 4328; LKap. pothole lake, mucky bottom, in 1½ feet of water (fruiting July 30, 1954), No. 6088.

Occasional, forming large colonies on the shores, margins, or bottoms of shallow, sandy or silted, small lakes.

I. macrospora Dur.

Sen. submersed, silted margin of small sandy lake (fruiting September 6, 1952), No. 4385.

Only one plant was found and that one in the same lake as a large colony of *I. muricata.* Although the large spores are distinctive, the habit is sufficiently similar to some colonies of *I. muricata* so that it may have been overlooked in mistake for that species. It has been little collected in Eastern Canada, and this collection represents a considerable extension of its range northward.

OPHIOGLOSSACEAE

Botrychium multifidum (Gmel.) Rupr.

NL. sandy roadside through young jack pine – aspen woods (fruiting July 22, 1953), No. 5259; Dup. loamy margin of shallow lake, No. 4225; Tas. meadow on alluvial river shore, No. 4292.

These have the smaller sterile leaf blade and less numerous segments of the typical form.

Rare, found only three times in the habitats cited above.

Gog. grassy lakeshore clearing in old pine stand (fruiting July 25, 1954), No. 6000.

This collection has the larger sterile leaf blade and more numerous segments of var. *intermedium* (D. C. Eat.) Farw. It was taken from a colony of a score or more plants of different ages, all having the coarser habit of the variety even when too young to bear fruit. However Gray's Man. notes: "In the northern half of its range often growing with typical *B. multifidum* and seeming to be merely the larger and older individuals."

Botrychium Lunaria (L.) Sw.

LaS. grazed poplar woods on shore of L. Abitibi (a single fruiting plant June 28, 1952), No. 2870; Kap. grassy river-bank, No. 3377.

This scanty material has the narrow leaf blade with toothed pinnae of forma *minganense* (Vict.) Clute, doubtfully separable from the typical form, which may also be discovered in the Clay Belt.

Rare. Seen only twice on the shore habitats cited above.

Three more species of *Botrychium* may occur in the Clay Belt. *B. simplex* E. Hitchc. var. *tenebrosum* (A. A. Eat.) Clausen was collected nearby in the Temagami Forest Reserve by W. R. Watson, July 13, 1922. At Peninsula, on the north shore of L. Superior, Taylor, Bannan & Harrison also collected *B. matricariaefolium* A. Br., No. 99; and *B. lanceolatum* (Gmel.) Ångstr. var. *angustisegmentum* Pease & Moore, No. 94.

Botrychium virginianum (L.) Sw.

VM. poplar woods in cut-over pinery, No. 5908; Math. ravine, poplar woods (shedding spores July 17, 1952), No. 3247; Coch. aspen poplar woods below high river-bank, No. 5187.

Frequent, occurring more commonly in deciduous woods.

NL. young poplar woods on limestone ridge, No. 2456; Kap. grass meadow around small lake, No. 4940.

This material has approximate to overlapping ultimate segments of the leaves suggesting var. *europaeum* Ångstr. They were both collected in June before the sporangia opened and are doubtfully referred to this variety, which is barely distinguishable according to the New B. & B. Reported northward in the James B. area by DLD.

Ophioglossum vulgatum L.

Coch. sedge marsh around small lake (sporangia not yet open August 19, 1954), No. 6165.

This material has the pale green sterile leaf blade gradually tapering to base of the more northern American var. *pseudopodum* (Blake) Fern. which is distinguished from the Eurasian typical plant in Gray's Man. but not in the New B. & B.

Found only once, but there is a very large colony. This collection represents a considerable range extension northward for this plant, which has such a remarkably local occurrence in Eastern Canada.

OSMUNDACEAE

Osmunda regalis L.

NL. thickets above alluvial shore of Elk L., No. 5299; VdO. lake shore on gravel, No. 3066; LWas. boulder shore, No. 5755; LKap. sandy and rocky river-bank (shedding spores July 28, 1954), No. 6063.

Occasional throughout the Clay Belt along shores of rivers and lakes particularly where boulders occur, and there forming extensive societies in the zone in front of the shore thickets. Our material is the North American var. *spectabilis* (Willd.) Gray. Not reported north of our area.

Osmunda Claytoniana L.

NL. wet grazed poplar woods (shedding spores June 11, 1952), No. 2486; Amos, margin of white spruce woods, No. 2968; Hst. roadside through black spruce forest, No. 3846.

Frequent in moist woods and becoming locally abundant in wet clearings and especially roadside ditches.

Following local rumours of the occurrence of cinnamon-fern we searched for *O. cinnamomea* L. in suitable habitats but found only sterile *O. Claytoniana* or *Pteretis pensylvanica* (Willd.) Fern. Taylor, Hosie *et al.* made only one collection of *O. cinnamomea* on the north shore of L. Superior and that was from the south-eastern end at Batchawana (Taylor). Fagerström (1949) reports a Hustich collection from Oskelaneo, just outside the eastern margin of the Clay Belt.

POLYPODIACEAE

Woodsia ilvensis (L.) R.Br.

LTQ. rocky lake shore, No. 4496; LMat. summit of Mt. Laurier, damp rocky crevices, No. 5808; Dup. bare rocky outcrop at falls, No. 4134; Coch. rocky river shore at falls, No. 4626; Tim. lake outlet, rocky outcrop, No. 3988; LKap. rocky crevices above river shore (sporangia ripe July 29, 1954), No. 6076.

Frequent, and characteristic of rocky shores and outcrops throughout the Clay Belt.

The New B. & B. notes that hybrids (*W. Abbeae* Butters, *W. confusa* T. M. C. Taylor) of *W. ilvensis* with *W. scopulina* D.C. Eat. have been observed in Michigan, Minnesota, and Ontario. We saw none of these in our Clay Belt material, which was all *W. ilvensis*. However, there is a possibility that these may occur within our region since the type of *W. confusa* was collected southwestward on L. Superior at Sibley by Taylor, Losee & Banman, No. 2159.

Several other species of *Woodsia* have been collected close to the Clay Belt and possibly occur rarely within our area. *W. Belli* (Lawson) Porsild was collected at Michipicoten by Hosie, Harrison & Hughes, Nos. 1129, 1130, and 1132 (distributed as *W. alpina* (Bolton) S. F. Gray and treated under that species by Gray's Man. and the New B. & B.). *W. glabella* R.Br. has been collected at several stations on the north shore of L. Superior, the nearest to our region being at Peninsula by Taylor, Bannan & Harrison, No. 142; in Quebec the nearest collection was made at L. Mistassini by J. M. Macoun, July 15, 1885. *W. oregana* D. C. Eat. has been collected at Blackwater R. not far westward, near L. Nipigon, by John Macoun, July 8, 1884, and was reported southward at Batchawana as forma *glandulosa* T. M. C. Taylor (*See* Am. Fern. J. 37:85, 1947). Material assigned doubtfully by C. A. Weatherby to *W. Cathcartiana* Robins. was reported at Batchawana (Taylor). The nearest collection of *W. scopulina* DC. Eat. was made at Cache L. in Algonquin Park by F. Morris, August 20, 1915. As in the case of the possible hybrids with *W. ilvensis* mentioned above, this species is also listed as a possibility in the Clay Belt.

Cystopteris fragilis (L.) Bernh.

LTO. crevices on limestone cliff, No. 5554; NL. moist rocky slope in poplar-spruce woods (sporangia ripe June 17, 1952), No. 2677; Kap. open rocky ledges above Remi L., No. 4887.

These specimens of this highly variable semi-cosmopolitan species all match the typical variety.

Scarce, and found only in rocky habitats on both Palæozoic limestones and Precambrian rocks.

Two varieties have been collected rarely on the north shore of L. Superior. Taylor (1938) reported var. *laurentiana* Weath. at Batchawana, and var. *Mackayii* Lawson was collected in Sibley Twp. by Taylor, Losee & Bannan, No. 222.

Cystopteris bulbifera (L.) Bernh.

NL. alder thicket in deep clay ravine near Englehart (sporangia ripe July 27, 1953), No. 5310; Kap. river-bank in cedar woods, No. 4915.

Rare, on wet shaded river-banks. Not reported northward.

Cystopteris montana (Lam.) Bernh. has been collected as close as Schreiber by Hosie, Losee & Bannan, No. 49. Although we did not find it, it probably does occur within the southern margin of the Clay Belt.

Pteretis pensylvanica (Willd.) Fern.

Matteuccia Struthiopteris, New B. & B.

LTO. damp elm-ash woods, No. 2531; Math. bottom of ravine in poplar woods (fertile fronds fully grown but not yet ripe July 17, 1952), No. 3239; Hst. ditch through black spruce forest, No. 3852.

Frequent, forming a characteristic ground cover under wet elm-ash woods and occurring frequently in wet clearings and ditches after the opening up of the forest.

Onoclea sensibilis L.

NL. clearing at lake shore, No. 2685; Amos, railway ditch through alder-willow thicket, No. 3014; Kap. alder thicket on river shore (fertile fronds fully grown, segments still closed July 20, 1952), No. 3373.

Common in shore thickets, wet woods, and in ditches and wet clearings.

Dryopteris Thelypteris (L.) Gray var. *pubescens* (Lawson) Nakai (*Thelypteris palustris*, New B. & B.) has been collected in the Temagami Forest Reserve by W. R. Watson, August 4, 1922. It is probable that it occurs nearby in the L. Timiskaming portion of the Clay Belt.

Dryopteris noveboracensis (L.) Gray (*Thelypteris noveboracensis*, New B. & B.) was collected on the north shore of L. Superior only at Batchawana (Taylor). The range of this species may possibly extend northward into our region.

Dryopteris disjuncta (Ledeb.) C. V. Mort.

Gymnocarpium Dryopteris, New B. & B.

NL. bank of creek through spruce-poplar woods, No. 2535; LAO. moist aspen poplar woods (sporangia ripe June 28, 1952), No. 2839; Tim. aspen poplar – spruce woods, No. 4851.

Common in moist woods throughout the Clay Belt. The typical fern of the wet black spruce forest.

Dryopteris Robertiana (Hoffm.) Christens. (*Gymnocarpium Robertianum*, New B. & B.) has been collected east of our region at L. Mistassini by J. M. Macoun, July 15, 1885, and southwest on L. Superior at Michipicoten Harbour by Hosie, Harrison & Hughes, No. 1094. This species may therefore be expected to occur within the Clay Belt.

Dryopteris Phegopteris (L.) Christens.

Thelypteris Phegopteris, New B. & B.

NL. bank of creek through spruce-poplar woods, No. 2542; WasR. wet aspen poplar – birch wood, lake shore, No. 5788; Kap. woods on river-bank (sporangia ripe July 20, 1952), No. 3370.

Occasional in moist woods preferring banks of streams and lakes.

Dryopteris spinulosa (O. F. Muell.) Watt

The intergrading varieties of this highly variable species of the Northern Hemisphere make it difficult to collect a truly representative series and to name them satisfactorily. It is therefore with some hesitation that the following varietal names have been assigned to the Clay Belt material.

NL. sandy loam in jack pine forest, No. 2614; Tim. aspen poplar – spruce woods, No. 4848; IF. alder-willow thicket on clay lake shore, No. 5046; LAO. alder-birch woods (shedding spores July 16, 1953), No. 5164; Coch. trail in old black spruce forest, No. 3920; Kap. opening in black spruce forest, No. 4894; LWas. black spruce forest, No. 5741.

The above series has the leaf blade glandless, pinnae mostly oblique, the basal pinnule of the lower side of the lowest pinnae longer than the one next to it, placing these specimens with the typical variety following Gray's Man. (*D. austriaca* var. *spinulosa*, New B. & B.)

Gog. rocky bank of creek (shedding spores July 26, 1954), No. 6019; Math. thickets around small boggy lake, No. 4652; Kap. old white spruce forest, No. 3467, and woods on river-bank, No. 3369.

These specimens have glandular blades and the basal pinnule equalling or shorter than the one next to it, placing them with var. *fructuosa* (Gilbert) Trudell in the treatment of Gray's Man.

LaS. poplar-birch woods on shore of L. Abitibi, No. 2818; LMat. black spruce-birch forest (sporangia mature July 4, 1954), No. 5801.

This material has horizontal pinnae narrowed rather abruptly to prolonged lance-linear tips and has therefore been named var. *intermedia* (Muhl.) Underw.

D. spinulosa and the varieties given above are frequent throughout our area and common in the L. Timiskaming portion. They occur in a wide variety of woodland habitats, in moist openings and thickets, and are characteristic plants of the richer woods of our region.

The var. *americana* (Fisch.) Fern. has been collected at many stations on L. Superior by Taylor, Hosie *et al.*, the nearest to the Clay Belt being at Peninsula; Taylor, Bannan & Harrison, No. 129. This variety probably will turn up within our region.

X Dryopteris Boottii (Tuckerm.) Underw.

Math. thickets around small boggy lake (fruiting July 13, 1952), No. 3113.

This was the only observation of this hybrid. The supposed parents, *D. spinulosa* var. *intermedia* and *D. cristata* occur together rarely in this frequent Clay Belt habitat. *D. cristata* was also collected at the same locality. Both parents occur northward, although this hybrid has not been reported beyond our region.

Dryopteris cristata (L.) Gray

Math. thickets below spring (some sporangia mature July 13, 1952), No. 3109; Tas. wet black spruce woods, No. 4319; Kap. thickets around bog, No. 3428.

Occasional in wet woods and thickets around boggy lakes and ponds.

Dryopteris marginalis (L.) Gray

LTQ. open rocky lake shore (all sporangia fully mature September 10, 1952), No. 4454; NL. granite outcrop, No. 2639.

Found occasionally in rocky habitats in the L. Timiskaming region and not collected in the Great Clay Belt. The Little Clay Belt is evidently the northern limit of this fern for this longitude.

Dryopteris fragrans (L.) Schott var. *remotiuscula* Komarov has been collected all round our area, and we expected to find it on several cliff faces that we visited. The nearest collection in the National Herbarium was made by John Macoun, July 16, 1884, at L. Nipigon, Ontario. There is another collection by R. Bell labelled July 1878 from the Missinaibi R., Ontario, which flows through the Clay Belt. Bell was on the Missinaibi R. in 1877 en route from L. Superior to James B. In 1878 he worked from L. Winnipeg to Hudson B. With the facts uncertain, this Bell specimen cannot be cited as a Clay Belt collection.

Polystichum Lonchitis (L.) Roth was collected on L. Superior by Taylor, Hosie *et al.* only at Batchawana (Taylor). It is possible that the range of this species extends northward into the L. Timiskaming portion of the Clay Belt. The same possibility exists for *P. Braunii* (Spenner) Fee var. *Purshii* Fern. reported at Batchawana (Taylor) and also collected in Sibley Twp., Taylor, Losee & Bannan, No. 52.

Polypodium virginianum L.

P. vulgare, New B. & B.

NL. granite outcrop, No. 2641; LAO. rocky shore at granite outcrop, No. 2851; Tas. talus slope in open spruce-birch woods, No. 5717.

This material, as well as all other observations in the field, belongs to the typical form and not to the other local and very exceptional forms. All our material was collected in June and had fertile evergreen fronds only from the previous season.

Occurs commonly along rocky shores and in open woods on the flanks of rock knobs and outcrops.

TAXACEAE

Taxus canadensis Marsh. Canadian Yew

NL. young birch-poplar woods on wet limestone, No. 2469; VdO. birch-spruce woods on lake shore, No. 3027; WasR. aspen poplar – birch woods, lake shore, No. 5787; Kap. old white spruce forest, No. 3462; Hst. black spruce-cedar woods beside rapids, No. 3783.

Occasional in damp woods, occurring generally throughout the Clay Belt in a variety of forest types as indicated in the representative habitats cited above. More frequent in the wet, second growth woods of the Little Clay Belt where it forms an important shrub-layer. Fruiting sparingly, the red colour of the ripening fruit began to show on July 8, 1952, at Val d'Or in No. 3027.

PINACEAE

Abies balsamea (L.) Mill. Balsam Fir

NL. with spruce and poplar on limestone ridge, No. 2494; Long. understory in old white spruce forest (with cones nearly fullgrown August 1, 1952), No. 3688.

All fruiting material seen was of the typical variety, none having the exserted bracts of the var. *phanerolepis* Fern., which occurs east of our area and into Ontario according to the range given in Gray's Man.

Abundant throughout the Clay Belt. Ranking second to black spruce in frequency, constituting 10 to 15 per cent of the typical forest of the region. In older forest stands, balsam fir forms an understory to the taller spruces and poplars, becoming more important when the veteran trees begin to die, or as advance growth following pulpwood cutting. In the important pulpwood operations of our region, balsam fir is commonly sold mixed with spruce. Subject to recurrent and relatively heavy attacks from spruce budworm.

Tsuga canadensis (L.) Carr. was not observed anywhere in the Clay Belt. Halliday (1937) states that hemlock is not present in the Haileybury Section of the Great Lakes – St. Lawrence Forest Region, but the range in the maps in "Native Trees of Canada" (1949) and Victorin (1935) does overlap L. Timiskaming. A report of hemlock at Longlac by a pulpwood scaler brought us to a log and stump which proved to be a slow-grown and atypical black spruce. The nearest record to our region is from Batchawana on L. Superior (Taylor). The northern limit of the main range of hemlock is evidently south of our area, although the possibility of an outlying tree in the L. Timiskaming area still remains.

Picea glauca (Moench) Voss White Spruce

NL. with poplar and pine on limestone ridge, No. 2493.

Occurring commonly on the better-drained sites, rarely forming pure stands. In the typical L. Abitibi division, white spruce makes up 3 per cent of the forest. The Clay Belt being generally flat and wet, the usual occurrence of white spruce is above river-banks at the level where drainage is sufficiently improved for its requirements. Here it grows to sawlog size in places where winter haulage is easy, and it produces the most popular lumber in the northern portion beyond the merchantable stands of pine. For these reasons white spruce has been heavily cut in preference to other trees both for lumber and pulpwood.

Picea rubens Sarg. has been collected in Blyth Twp. about 15 miles northwest of North Bay by C. E. Atwood, Nov. 2, 1946. This station is about 40 miles due south of the southernmost point of the Clay Belt. We therefore looked carefully for red spruce around L. Timiskaming but without success. It may possibly be found by future collectors within the Clay Belt.

Picea mariana (Mill.) BSP Black Spruce

NL. black spruce – larch bog (new cones 1.5 cm. long, June 13, 1952). No. 2561.

Abundant. The chief forest tree of the low lying, poorly drained areas, so characteristic of the greater part of the Great Clay Belt; becoming less frequent in the Little Clay Belt. Occurring commonly in pure stands of vast extent, black spruce becomes mixed with larch around open boggy places, occasionally with white cedar on low shores and depressions, and more commonly with balsam fir, balsam poplar, white birch, white spruce, and jack pine as the drainage improves at river-banks, on the flanks of rock knobs, and around gravelly moraines and sandy outwash plains.

The proportion of black spruce has been reduced by selective pulpwood cutting. There is now (Hosie, 1953) considerably less spruce and balsam fir in the cut-over forest, and the spruce content is low compared to that of balsam fir. Furthermore the area of black spruce forest has been reduced by the growth of farming and settlement.

In the Abitibi division, black spruce constitutes about 60 per cent of the forest. It is throughout the Clay Belt the chief source of pulpwood for the great pulp and paper industry. It provides most of the raw material for this, the largest industrial enterprise in the whole Canadian economy. Because of its small size it is less desirable as lumber. This species now ranks first in value of commercial production of all the trees of Canada.

Larix laricina (DuRoi) K. Koch Tamarack

LaS. black spruce bog, No. 4561; OttR. margin of open bog, No. 5828. Both specimens bearing old empty cones: observations on seasonal fruiting lacking.

Occurs frequently in boggy black spruce forest and forms a characteristic zone of stunted trees around open bogs, rarely occurring in pure stands. At the present time tamarack is reduced in number, because it has been subjected to devastating and recurrent attacks of sawfly. Possibly

a minor constituent in the Clay Belt even before the sawfly attacks of recent generations and now amounting to less than one per cent of the forest.

Pinus Strobus L. Eastern White Pine

LTQ. lake shore, foot of rocky outcrop, No. 4447; NL. shallow soil on limestone ridge, No. 2497; VdO. on sand, jack pine – birch forest, No. 3050; Dup. sandy bank above lake, No. 4212; Tim. sandy soil near Dana L. with red pine, lumbering in progress, No. 4083. Observations on fruiting lacking.

Frequent in the L. Timiskaming area where stands of merchantable timber occur on the surrounding rocky hills and shores of the lake. These pineries were first cut in the later days of the big operations for the highly desirable pine lumber and are still yielding on a smaller scale. Modern lumber operations were in progress on the pinery at Dana L., 20 miles west of Timmins, from which No. 4083 was taken. Northward in the Great Clay Belt, white pine becomes occasional and rare. The northern outliers of the species probably all occur within the Clay Belt whose northernmost extent approximately represents the extreme northern limit of its range agreeing with the range map given by Haddow (1948). In the Great Clay Belt white pine constitutes less than one per cent of the whole forest. It is difficult to estimate the original composition of the forest of the L. Timiskaming portion, because it has largely been cleared for farms, but the proportion of white pine must have been substantially greater in that southern portion formerly.

Pinus resinosa Ait. Red Pine

NL. shallow soil on limestone ridge (pollen shedding June 12, 1952), No. 2496; Dup. rock outcrop above rapids, No. 4126; VdO. steep bank on lake shore, No. 3052; Sen. sandy lake shore, No. 4391; Tim. sandy soil near Dana Lake, stand of large trees, with white pine, lumbering in progress, No. 4084.

A little more frequent than white pine, often occurring with it and having similar habitat preferences and distribution in the Clay Belt. The notes given above on the occurrence and range of white pine apply also to the red pine.

Pinus sylvestris L. Scots Pine

IF. young jack pine forest, planted about 40 years ago, reproducing by seedlings, tree 30 feet high, 12 inches diameter, on Lot 12, Concession IV of Calvert Twp. Bearing young cones of this season 1 cm. long, July 9, 1953, and older cones of the two preceding seasons.

Introduced and rare. This specimen comes from a colony started by a row of trees planted alongside the Ontario Northland Railway. It is significant that reproduction by seeding into the surrounding, native young jack pine forest has been successful. Scots pine may thus become locally naturalized on a larger scale if more plantations are made along the new highways and developments in the Clay Belt. Not reported north of our region.

Pinus Banksiana Lamb. Jack Pine

NL. in open red and white pine woods, shallow soil on limestone (male cones open with pollen shed June 12, 1952), No. 2495; IF. young jack pine forest (seed cones of previous season retained and still closed July 9, 1953), No. 5038; Kap. rocky outcrop at falls, No. 3560.

Forming extensive pure stands on sandy eskers, moraines, and outwash plains, occurring elsewhere on dry sites, rocky, gravelly or well-drained clay mixed with spruce, poplar, and birch. In the Abitibi division, which probably represents an average variety of conditions for the Clay Belt, jack pine constitutes about 8 per cent of the forest and ranks fourth in abundance after black spruce, balsam fir, and aspen poplar. Jack pine makes good pulpwood to supply the important pulp and paper industry, particularly in the western portion of our region.

Thuja occidentalis L. Eastern White Cedar

LTO. lake shore in spruce-poplar forest, No. 2512; Math. rock shelves beside rapids; heavily laden with pistillate and staminate flowers of that season (pollen shed before July 13, 1952), No. 3162; LWas. river-bank, black spruce-poplar woods, No. 5748.

Frequent and sometimes locally common along shores of rivers and lakes and in wet black spruce forest. In the L. Abitibi division amounting to less than one per cent of the whole forest. More common in the L. Timiskaming area than northward where its growth is stunted forming strongly tapered trunks, often rotten. Near Timmins we saw a fire ranger's cabin made of remarkably sound and uniform logs of white cedar, but since the wood is generally low in quality and quantity, local material is not much used. The main area of the species extends through the Clay Belt northward to the foot of James B. Nowhere in the Clay Belt does it form large pure stands like the cedar swamps of southern Ontario and Quebec. It fruits successfully throughout our area, judging by the quantity of old empty cones on the trees.

Juniperus communis L. Dwarf Juniper

LTQ. large mats, 3 feet high, on rocky lake shore, No. 4408; and open red pine woods on rocky hillside (with many fruits from a previous season June 6, 1953), No. 4681.

These two collections were from large mats having the long, straight, and relatively narrow leaves that distinguish var. *depressa* Pursh in Gray's Man.

Locally common on exposed rocky sites around L. Timiskaming, very rare elsewhere in the Little Clay Belt.

Arnt. crevices in exposed rock cliff on Cheminis Hill (fruits of a previous season 6 mm. in diameter June 20, 1952), No. 2745. Tas. top of rock cliff on Plamondon Hill, No. 5696.

This material from exposed rocky habitats of the hills of the Great Clay Belt has the very depressed habit, curved, short, and relatively broad leaves of var. *saxatilis* Pall. The fruits are too small for the var. *megistocarpa* Fern., which occurs on coasts east and north of our area according to Gray's Man.

The var. *saxatilis* is rare in our area and was found only on bare rocky hills in the northern portion of the Quebec Clay Belt.

Juniperus horizontalis Moench Creeping Juniper

LTQ. open, rocky lake shore (with green fruits 2 mm. long September 11, 1952), No. 4493; and rocky lake shore, open pine woods, No. 5265; LWas. sandy beach (with one blue fruit of previous season and many abortive ones, June 28, 1954), No. 5769.

Rare and found only on a rocky and a sandy lake shore in the Clay Belt of Quebec. These two stations are on the only two lakes in the Clay Belt where Palæozoic limestone outcrops. The collections were made within a few miles of the outcrops but not on them.

TYPHACEAE

Typha latifolia L.

VM. ditch near dam, No. 4504; Math. marshy river shore (stamens having shed pollen July 17, 1952), No. 3265.

A common and characteristic marsh plant of our region occasionally colonizing wet ditches and clearings.

SPARGANIACEAE

Sparganium eurycarpum Engelm.

Dup. lake shore, silted bay (fruit fullgrown August 20, 1952), No. 4116; Tim. shallow water, marshy widening of Frederick House River, No. 4021; LKap. sedge marsh, river shore (staminate heads still attached, fruit immature July 29, 1954), No. 6086.

Scarce in the Clay Belt. Shallow water, silted and marshy shores. Reported as far north as Albany on James B. by DLD.

Sparganium americanum Nutt.

VM. 2 feet of water, creek through cat-tail marsh (staminate heads immature July 20, 1954), No. 5946; Gog. creek through marsh (pistillate heads fullgrown August 2, 1954), No. 6167.

Rare. Collected in marshy creeks only near the southern boundary of our area where the species evidently reaches the northern limit of its range.

Sparganium chlorocarpum Rydb.

Dup. wet ditch in black spruce forest (fullgrown fruits August 22, 1952), No. 4163; Tas. alluvial river shore, No. 4302; Coch. silted outlet of creek, No. 3901; Kap. marshy shore of small lake (pollen shedding July 24, 1952), No. 4607.

Locally abundant and generally distributed throughout the Clay Belt on muddy and marshy shores of lakes and rivers especially at creek outlets. Occurring also in wet clearings and ditches in the forest.

52468-6—6

Amos, mucky shore of small lake, No. 5448, and silted clay lake shore, No. 5409; Tas. mucky river shore, No. 4301; Coch. mucky shore of small lake (fruits fullgrown August 13, 1952), No. 3972.

These specimens represent the extreme dwarfed state and have therefore been named var. *acaule* (Beeby) Fern. Some of the Amos material (No. 5409) is intermediate with the typical condition which passes into the variety according to Gray's Man.

Occasional and much less frequent than the typical state. Preferring mucky habitats where there is much organic matter mixed with the alluvium. Habitat data suggest that this variety merely represents a response to increasing amounts of humus in the silt.

Sparganium angustifolium Michx.

Sen. off shore of small sandy lake, No. 4381; Tas. silted bay of sandy lake, No. 4327; Dup. quiet bay of L. Hébécourt among pondweeds (with some fullgrown fruits August 24, 1952), No. 4216; Long. backwater of river (pollen recently shed from some staminate flowers July 30, 1952), No. 3653.

Common and characteristic off-shore water plant with floating leaves. General throughout the Clay Belt in rivers, small lakes, and quiet bays.

It was expected that *Sparganium multipedunculatum* (Morong) Rydb. would be found in the Clay Belt, because it is listed from southern Ontario (Soper, 1949) and was collected north on James B. on Charlton I. by A. E. Porsild, No. 4291. However there are no records of it in the Taylor, Hosie *et al.* collections from the north shore of L. Superior. In our area we may have overlooked it or misidentified it with some similar species, and so it should remain on the list of species possibly or probably to be found in the Clay Belt.

Sparganium fluctuans (Morong) Robins.

Amos, one foot of water, muddy shore of Harricanaw R., No. 5421; Dup. shallow water in quiet bay of L. Hébécourt (oldest fruits mature and falling off August 24, 1952), No. 4640; Gog. shoal off rocky lake shore (staminate flowers shedding pollen July 25, 1954), No. 6007; Hst. silted bay, off marshy shore of L. Ste. Thérèse, No. 3804.

Frequent in quiet waters and generally distributed throughout the Clay Belt.

Sparganium minimum (Hartm.) Fries

VM. 2 feet of water in creek through cat-tail marsh (staminate flowers shedding pollen July 20, 1954), No. 5945; Tas. marshy shore of pond, No. 4285; Coch. shallow water of small silted lake, No. 4629; Long. silted, marshy shore of small lake (oldest pistillate heads fully grown July 29, 1952), No. 3566.

Frequent in shallow water and silted, marshy shores of small lakes and ponds.

ZOSTERACEAE

Potamogeton filiformis Pers.

Dup. sheltered bay of L. Hébécourt (fruits mature August 24, 1952), No. 4211.

This material has the whorls of the spike crowded. This is characteristic of var. *borealis* (Raf.) St. John, the more common variety of the species according to Gray's Man.

Collected only once and therefore apparently rare, but it may have been overlooked among the other pondweeds.

Potamogeton vaginatus Turcz.

Tim. shallow water, Porcupine L. (fruit mature August 17, 1952), No. 4037; Coch. in 6 feet of water, Lillabelle L., No. 6152; Hst. shallow water, Forde L., Nos. 3729 and 3732.

This series has blunt or short-apiculate leaves with loose, sub-inflated sheaths and many-whorled spikes, which key out to *P. vaginatus* following Gray's Man. In the new B. & B., however, it is stated that plants of its range identified as *P. vaginatus* are chiefly *P. filiformis*.

Occasional in the larger lakes of the Clay Belt.

Potamogeton pectinatus L. has been reported north of our region by DLD, by Hustich (1955) at Renison on the Moose R., and collected southwestward in Sibley Twp. on L. Superior by Taylor, Losee & Bannan, No. 233. We made a collection at Longlac in backwater of river, No. 3656, which at first suggested *P. pectinatus* but was later revised to *P. vaginatus*. There remains the possibility that *P. pectinatus* will turn up within the margins of the Clay Belt.

There is a collection of *Potamogeton Robbinsii* Oakes by R. Bell labelled August 1880, No. 4155, from the Missinaibi R. As in the case of *Dryopteris fragrans* the location and date of the specimen are uncertain. *P. Robbinsii* probably does occur within the Clay Belt as it has been collected at several stations on L. Superior, the nearest being at Peninsula; Taylor, Bannan & Harrison, No. 1201.

Potamogeton confervoides Reichenb.

Sen. clear sandy lake, close to shore (ripe fruits falling off September 6, 1952), No. 4380.

This distinctive species was seen only once in the Clay Belt. It has been collected but rarely in Canada and is at its northern limit in our area.

Potamogeton zosteriformis Fern.

Tim. widening of Frederick House R., No. 4025; Coch. in deep water of Lillabelle L. (fruit mature August 18, 1954), No. 6158; LKap. marshy bay, No. 6044; Kap. silted bay or river, No. 4611; Hst. shallows, Forde L., No. 3730; Ger. mouth of narrow marshy bay of Long L., No. 6141.

Frequent and locally abundant in larger lakes and rivers of the Clay Belt, often in muddy water.

Potamogeton foliosus Raf.

Hail. backwater below rocky rapids of Montreal R. (fruit mature July 31, 1953), No. 5361; Coch. sandy pothole lake, close to shore, No. 3858.

These specimens have the filiform rootstock, glandless leaves, and undulate to dentate keeled fruits on short, subcapitate spikes that distinguish this species from others in the same difficult subsection of the genus. The stems are loosely branched as in the typical form.

52468-6—6½

Apparently rare and found only twice. According to the range map in Fernald (1932), the Clay Belt is at or near the northern limit of this species.

Tim. shallow water of Porcupine L., No. 4036.

This sterile material is more bushy-branched and closely matches specimens identified by Fernald as var. *macellus* Fern.

This species and its variety are apparently rare in our region occurring in clear, shallow water close to shore.

Potamogeton Friesii Rupr.

Long. backwater of river (some fruits apparently mature among many abortive ones, July 30, 1952), No. 3649.

This collection was taken from a colony with very long, sparingly branched stems with winter buds terminating the short lateral branches. The stipules are strongly fibrous, the leaves minutely cuspidate at the rounded apices, delicately 5-nerved and thin.

Identified only once. This collection lies well within the range of the species.

Potamogeton strictifolius Ar. Benn.

Coch. in 3 and 6 feet of water in Lillabelle L. (mature fruit falling off August 18, 1954), Nos. 6155 and 6154; Hst. silted bay, off marsh in L. Ste. Thérèse, No. 3808.

All this material has very long stems branching freely above. The leaves are often revolute and firm, with three veins and obtuse tips. The stipules are strongly fibrous and the outer leaves of the winter buds dilated and strongly corrugated. It has therefore been referred to the typical variety of this species.

Identified at only two localities in the Clay Belt, which lie at the northern limit of the range given in Fernald's (1932) map but has since been reported north of our area by DLD.

Hst. close to shore of shallow Forde L., No. 3734.

This collection was sterile. Its less fibrous stipules and firm leaves gradually tapering to slender tip closely match specimens identified by Fernald as var. *rutiloides* Fern.

This species is rare in our region, occurring in heavily silted lakes.

Potamogeton pusillus L.

NL. creek outlet into Blanche R. (fruits mature July 29, 1953), No. 5336, and in the same muddy river, 3 feet deep, No. 5345; Amos, sluggish stream through marsh, No. 5457; Dup. marshy backwater of river, No. 4175; Coch. small, sandy, shallow lake, No. 3854; Kap. small pond, No. 3476, meandering creek, No. 6104; LKap. marshy bay, No. 6042, in one foot of water, marshy backwater, No. 6074; Hst. close to bank of Nagagami R., No. 3705.

The above series has capillary stems, narrow leaves with delicate lateral nerves, scarious-membranaceous stipules, a pair of small glands and

achenes about 2 mm. long, placing these specimens with this variable species as treated by the New B. & B. In Gray's Man. it is distinguished from *P. Berchtoldi* Fieber on the basis of free margins of stipules. All the material listed by DLD is referred to four varieties of *P. Berchtoldi.*

Common in shallow, quiet waters throughout the Clay Belt and abundant in sluggish creeks through marshes.

Potamogeton obtusifolius Mert. & Koch

LKap. marshy bay, No. 6043, and marshy backwater 3 feet deep (fruit mature July 30, 1954), No. 6090.

These two collections from different places on the same lake have the flat, delicately membranaceous stipules with very translucent, one-nerved, obtuse leaves which distinguish this species from others in this confusing subsection of the genus.

Identified in only one lake at the southwestern border of the Clay Belt. This lies in a gap in the north-central part of the range map in Fernald (1932).

For *P. Berchtoldi* Fieber *see* under *P. pusillus.*

Potamogeton Spirillus Tuckerm.

Dup. shallow bay of L. Hébécourt (mature fruits August 24, 1952), No. 4641.

This is our only collection of this unmistakable little pondweed. Judging from Fernald's (1932) map, the Clay Belt is at or near the north-central limit of its range.

Potamogeton epihydrus Raf.

Amos, Harricanaw R. at creek outlet, 3 feet deep, muddy bottom (fruits mature August 6, 1952), No. 5426; Dup. shallow bay of L. Hébécourt, No. 4217; Math. bay in small lake, No. 5541; Kap. near shore of Kapuskasing R., No. 3512; Hst. shallow Forde L., No. 3731.

Fernald (1932) distinguishes var. *Nuttallii* (C. & S.) Fern. on the basis of strongly distichous submersed leaves, rather crowded on sterile shoots, and generally smaller dimensions of leaves and dorsal keel of fruit. The New B. & B. states that it has essentially the same range and is intergradient with the typical. Variation in the Clay Belt specimens does not warrant separation of the material.

Frequent in rivers and lakes throughout the Clay Belt.

Potamogeton alpinus Balbis

Ogden (1943) distinguished two North American varieties "which in their typical development are strongly marked and easily distinguished, but with many intergrades." Both varieties are represented in the Clay Belt material.

Coch. sandy pothole lake (fruit still immature August 8, 1952), No. 3860; Hst. near bank of swift Nagagami R., No. 3704.

These two collections with submersed leaves eight times as long as broad have been named var. *tenuifolius* (Raf.) Ogden.

Kap. small lake (fullgrown fruit July 24, 1952), No. 3456, and meandering creek, 4 feet of water, No. 6103; Hst. near bank of Nagagami R., No. 3709; Long. sandy lake, No. 3567.

The above series represents var. *subellipticus* (Fern.) Ogden with submersed leaves less than eight times as long as broad and a strong tendency to produce floating leaves.

This species is frequent in rivers and lakes of the Clay Belt, which is well within the northern limit of range. Ogden believed that there was no support for the idea that var. *subellipticus*, which prefers shallow water, is merely an ecological state of the deep-water var. *tenuifolius*.

Potamogeton amplifolius Tuckerm.

VM. 4 feet of water, off cat-tail marsh in L. Laperrière, No. 5947, and in the same lake, deeper water, No. 4525; Math. in 3 feet of water of sandy pothole lake, No. 3198; Gog. 6 feet of water off rocky lake shore, No. 6008; Kap. deep backwater of Kapuskasing R., No. 3514.

All the July collections bear plentiful immature spikes; but in the September collection (No. 4525) the fruit was not formed, and we saw no good fruiting material in the Clay Belt.

Occasional. This species prefers deeper water and is at a disadvantage in our area where most of the lakes are shallow. Judging from Ogden's (1943) map, our region is at or near the northern limit of range of this species.

Potamogeton gramineus L.

The different treatments of this exceedingly variable species show the difficulties of recognizing worthwhile varieties and forms in this common pondweed. The New B. & B. states that the plants of its range belong chiefly to var. *graminifolius* Fries and that the other described varieties and forms "seem to represent fluctuations correlated with depth or velocity of the water rather than taxonomic entities." Gray's Man. follows Ogden (1943) in recognizing the typical and two varieties. In Fassett's Manual of Aquatic Plants (1940) four forms of the var. *graminifolius* are keyed and illustrated.

The Clay Belt material was sorted as follows:

(1) Under the var. *typicus* of Ogden belongs the var. *graminifolius* Fries of Fassett's treatment represented by the following specimens:

NL. off cat-tail marsh on Blanche R., No. 5347; Hst. silted bay of L. Ste. Thérèse, No. 3793; Ger. narrow marshy bay of Long L., No. 6139, and marshy river outlet at Ogoki L., No. 6142; Dup. shallow silted bay of L. Hébécourt (with some mature fruits among many abortive ones August 24, 1952), No. 4208; Tas. slow-moving stream at inlet to Chicobi L., No. 4261.

Common and widespread, preferring shallow bay waters and sluggish marshy streams.

(a) The following material has internodes much longer than the leaves as in Fassett's key for forma *longipedunculatus* (Merat) House.

VM. 6 feet of water off high rocky shore of L. Laperrière, No. 5954, and from near shore of the same lake, No. 4520; Tim. small sandy lake, No. 4053.

(b) The form without submersed leaves growing on muddy shores is recognized in Fassett's key as forma *terrestris* (Schlecht.) Carpenter and is represented by the following:

LAO. sandy, silted lake shore, No. 5138; Ger. muddy shore of Elder L. with *Equisetum fluviatile,* No. 6137.

Occasional on protected muddy shores.

(2) var. *maximus* Morong is treated in Fassett's key as var. *graminifolius* forma *maximus* (Morong) House. This variety has longer, wider leaves with more nerves. Ogden (p. 148) cites two Clay Belt collections: Lac des Quinze (Baie Gillies), Témiscamingue-Abitibi, Victorin, Nos. 8194 and 8195. It is represented in our collections by—

Long. backwater of river (some fullgrown fruits among many abortive ones, July 30, 1952), No. 3654; LKap. off rocky point in deep water, No. 6048.

A deep-water form occurring occasionally in the Clay Belt where most of the lakes are relatively small and shallow.

(3) The form with linear leaves, small and very numerous on short branches, is treated by Ogden as var. *myriophyllus* Robbins and by Fassett as var. *graminifolius* forma *myriophyllus* (Robbins) House. We collected the following:

LAO. in 1½ feet of water with *Scirpus acutus,* No. 5141, and in another bay of the same large shallow lake in marshy river outlet (some fruits nearly fullgrown July 16, 1953), No. 5159; Hst. shallow pond, much overgrown, No. 3821, and silted bay off marsh on L. Ste. Thérèse, No. 3807; Ger. narrow marshy bay of Long L., No. 6138.

Common in shallow water of lakes and rivers throughout the Clay Belt.

Potamogeton natans L.

LaS. 6 feet of water, off cat-tail marsh in L. LaSarre, No. 5887; LAO. marshy river outlet, No. 5149; Hst. shallow Forde L., No. 3728; Long. backwater of river (fruit immature July 30, 1952), No. 3652.

Frequent in lakes and streams throughout the Clay Belt.

Potamogeton Oakesianus Robbins has been reported at Batchawana on L. Superior by Taylor, but there are no collections from the Upper Ottawa River valley nor from localities north of the Great Lakes – St. Lawrence River system.

Potamogeton praelongus Wulfen

Dup. sheltered bay of L. Hébécourt, stem 10 feet long, No. 4210; Coch., in deep water of Lillabelle L. (mature fruit August 18, 1954), No. 6157.

Occasional in deep water in our region.

Potamogeton Richardsonii (Ar. Benn.) Rydb.

NL. muddy Blanche R., 4 feet deep, No. 5338; Dup. shallow bay of L. Hébécourt (fruits mature August 24, 1952), No. 4213; Amos. tributary creek of Harricanaw R., 6 inches of water, muddy bottom, No. 5427; Gog. off rocky lake shore, No. 6006; Long. backwater of river, No. 3648.

Common in rivers and lakes, often in shallow muddy water, occurring generally throughout the Clay Belt.

The Clay Belt lies within the range of *Zannichellia palustris* L. which has been collected in all directions around our region, north in James B., south in southern Ontario, east in Quebec and west in Manitoba. Although we did not see it, there remains the possibility that it may be found in our area.

NAJADACEAE

Najas flexilis (Willd.) Rostk. & Schmidt

VM. near shore on silted bottom of L. Laperrière, No. 4522; Tim. sandy lake, close to shore thickets (fullgrown fruits August 17, 1952), No. 4058; LKap. in one foot of water, marshy backwater, No. 6072.

Occasional in shallow water close to protected shores on silted or marshy bottoms. Not reported northward.

JUNCAGINACEAE

Triglochin maritima L.

NL. open alluvial shore of Elk L., No. 5290; Arnt. wet place behind shore (flowering June 21, 1952), No. 2786; Hst. marshy shore of L. Ste. Thérèse, No. 3797; Long. silted shore of Phipps L. (fruit mature July 30, 1952), No. 3630.

Occasional on silted shores and marshes and in wet ditches.

Triglochin palustris L.

Long. silted shore of Phipps L. (mature fruit July 30, 1952), No. 3616.

Found only once in our region but abundant at that locality.

Scheuchzeria palustris L.

LaS. open sphagnum bog, No. 5898; Math. boggy shore, *Chamaedaphne* thicket (some follicles split open July 13, 1952), No. 3100; LKap. open tamarack bog, No. 6094.

Occasional and locally very abundant in open sphagnum bogs, extending into stunted tamarack–black spruce zone, occurring also in shore thickets around small boggy lakes. Our material is var. *americana* Fern.

ALISMATACEAE

Alisma triviale Pursh

A. Plantago-aquatica, New B. & B.

Dup. marshy creek outlet, No. 4191; LAO. alder-willow thicket, No. 2866; Gog. inshore side of cat-tail marsh (first flowers July 24, 1954), No. 5994; Kap. marshy river shore, No. 4974; Long. silted lake shore, No. 3596.

Occasional and locally abundant in shallow water and on marshy shores of rivers and lakes. Collected as far north as Albany on James B. by DLD.

Sagittaria graminea Michx.

With which the New B. & B. includes *S. cristata.*

Sen. in one foot of water in small sandy lake in Louvicourt Twp., No. 4378, and in same lake with seasonally lower water-level, sandy lake shore stranded at creek outlet (flowering August 25, 1953), No. 5532.

Found at only one locality in the eastern Clay Belt and not reported northward.

Sagittaria latifolia Willd.

NL. creek outlet, emersed in one foot of water, No. 5339; VdO. small lake in 4 feet of water, No. 5523; Amos, stranded on mucky shore of small lake, No. 5449; LAO. one foot of water, river shore (flower buds opening July 17, 1953), No. 5168; Kap. river shore through marsh, No. 6083; Hst. near bank of Nagagami R., one foot deep, No. 3699.

The above series have leaves at least two-thirds as broad as long and have been placed with the typical form of this exceedingly variable species as treated in Gray's Man.

Hst. silted bay off marsh in L. Ste. Thérèse, No. 3809.

This is an odd specimen with many broadly linear phyllodia and halberd-shaped leaves.

NL. creek outlet on shoreline of Blanche R., No. 5340; Dup. lake shore, silted bay, No. 4115; Hst. shore of Nagagami R., No. 3697.

In these specimens the body of the leaf is narrowly triangular and the width within the limits of forma *hastata* Robins.

Long. silted shore of Phipps L., No. 3633.

In this collection the body of the leaf is linear and the width within the limits of forma *gracilis* (Pursh) Robins.

An abundant species throughout the Clay Belt in shallow water and mucky shores of rivers and lakes. Reported northward in the James B. area by J. M. Macoun (1897).

Sagittaria cuneata Sheldon

VM. marshy shore of L. Laperrière, No. 5961; Dup. marshy backwater of Duparquet R. (achenes ripe August 22, 1952), No. 4170; Kap. river-bank, No. 3380; Long. backwater of river, No. 3655.

Apparently only occasional in the Clay Belt and much less common than *S. latifolia,* although it may have been overlooked in mistake for the latter species. The achenes are too young in Nos. 3380 and 3655 for certain identification, although the vegetative characters match this species.

HYDROCHARITACEAE

Elodea canadensis Michx.

Anacharis canadensis, New B. & B.

Tim. off shore of small lake in 3 feet of water, No. 4062; Coch. in 2 feet of water in Lillabelle L., No. 6151, and in same lake, near outlet, No. 3898.

Apparently rare in the Clay Belt, although it may have been overlooked in dark waters.

No fertile plants were observed.

Elodea Nuttallii (Planch.) St. John

Anacharis Nuttallii, New B. & B.

Kap. silted bay of river, No. 3515; LKap. marshy backwater, 3 feet deep, No. 6091.

Found only at two places 60 miles apart on the same Kapuskasing River system. Rarely collected in Canada and here apparently at its northern limit. The plant is habitally so similar to sterile material of *Callitriche hermaphroditica* that it may easily be mistaken for it in the field.

No fertile plants observed.

Vallisneria americana Michx.

VM. near shore of L. Laperrière, 4 feet deep (fruiting September 13, 1952), No. 4521.

Found but once and only in the L. Timiskaming portion of the Clay Belt. It was reported previously by Victorin (1935) from the same vicinity at Solitaire R., which is about 40 miles north of Ville Marie.

The L. Laperrière colony had many spiral scapes with poorly developed fruits in mid-September suggesting that it may not produce good seed in our region where it reaches its northern limit of range.

GRAMINEAE

Bromus ciliatus L.

Sen. sandy shore of L. Parent, No. 4366; Hst. clearing on river-bank (spikelets mature August 3, 1952), No. 3708, and roadside through black spruce forest, No. 3847.

These have glabrous leaf-sheaths and are referred to the typical variety, which according to Gray's Man. is the commoner plant northward.

LL. roadside in townsite, No. 3092; Math. river shore (in anthesis July 17, 1952), No. 3256; Kap. around small lake, No. 3423.

These represent var. *intonsus* Fern., with villous sheaths, which is the common plant southward, according to Gray's Man. In the Clay Belt it was collected more frequently than the typical variety.

Common on shores, banks, clearings, along forest roads, and into waste ground around settlements. The spikelets of one collection, Hst. river shore, No. 3845, had produced mite galls, making them appear as if viviparous.

Bromus Kalmii Gray has been collected on the north shore of L. Superior only in Sibley Twp. by Taylor, Losee & Bannan, Nos. 1958 and 1959 (distributed as *B. purgans*, revised by W. G. Dore). It is possible that its range may extend into the Clay Belt.

BROMUS INERMIS Leyss. Smooth Brome

LL. on sand, road through jack pine forest, No. 3093; IF. railway through young jack pine forest, on sand (in anthesis July 9, 1953), No. 5029.

This introduced grass was found only twice. It seems to have found a suitable habitat for becoming naturalized along roads through the sandy jack pine forests of our region. According to Frankton (1955) it is a valuable pasture and hay grass and can scarcely be regarded as a weed.

The introduced BROMUS SECALINUS L. has been collected on L. Superior at Michipicoten Harbour by Hosie, Harrison & Hughes, No. 1532; and at Peninsula by Taylor, Bannan & Harrison, No. 867. Although not observed by us, it may occur in waste places and on roadsides in the Clay Belt.

Nine more introduced species of BROMUS have been listed for southern Ontario by Soper (1949). There are no records of their occurrence north into the Precambrian Shield. It is possible, however, that some more of these weedy species will turn up within our region.

Schizachne purpurascens (Torr.) Swallen

LTO. woodland trail along shore, No. 2519; OttR. red pine stand (grains mature July 15, 1954), No. 5873; LaS. thicket below rock outcrop, No. 2874; Kap. river-bank in white cedar woods, No. 4911.

These specimens and all other Clay Belt collections and observations had the bronze to purplish spikelets of the typical form.

Frequent in dry to moist woods and thickets.

FESTUCA OVINA L.

VM. gravelly road cutting (det. A. E. Porsild), No. 4707.

The following specimen has the hispid lemmas of forma HISPIDULA (Hack.) Holmb.

VM. gravelly road cutting (in anthesis June 7, 1953), No. 5547.

This polymorphic, introduced species was found at only one locality in the southern portion of the Clay Belt.

Festuca ?saximontana Rydb.

Kap. town park, rocky shelf on river shore (overmature spikelets July 26, 1952), No. 4610.

This poor material, collected on an exposed rocky shore below a hydro-electric power dam, is difficult to identify. The spiciform panicles have empty glumes, and the best leaves are scabrous toward their tips. It has therefore been referred with some doubt to *F. saximontana*. This species has been collected frequently on the north shore of L. Superior as close to our region as Schreiber by Hosie, Losee & Bannan, No. 1255.

Festuca occidentalis Hook. has been reported on L. Superior at Batchawana by Taylor. It is possible that this species may reach our region.

Carex aquatilis Wahlenb.

LWas. sandy beach (in anthesis June 28, 1954), No. 5767; Amos, river shore, No. 3018; LaS. marsh, No. 2837; Kap. lake shore, No. 3436; Hst. silted lake shore, No. 3798; Long. silted shore, Nos. 3634 and 3635.

The Clay Belt material shows much variation. As the New B. & B. remarks, this species is especially variable in the pistillate scales. In No. 2837 the projecting scales are long acuminate as in var. *cuspidata* Laestad. In Nos. 3436 and 3798 the scales are nearly concealed by the perigynia as in var. *virescens* Anders.

A frequent plant of shallow shores throughout the Clay Belt.

A new species *Carex Rousseaui* Raymond in the section *Acutae* has been described by Marcel Raymond (Naturaliste Canadien, 82, pp. 31-32, 1955) from a Clay Belt collection by Jacques Rousseau on the upper Ottawa R. near Cadillac, which is 30 miles west of Val d'Or.

Carex nigra (L.) Reichard

Kap. river shore at Big Beaver Falls (perigynia immature July 26, 1952), No. 3545.

Found only once on the shore of the Kapuskasing R. growing in loose tufts. Apparently rare in our area, although it may have been overlooked in mistake for other species of the section *Acutae*.

Carex lenticularis Michx.

Amos, sandy lake shore (fruit ripe and dropping July 3, 1952), No. 2951; Arnt. sandy shore, No. 4556; LAO. rocky islets, No. 5117; Tim. sandy river shore (in anthesis June 21, 1953), No. 4842; LKap. rocky lake shore, No. 6049.

These specimens, and all other collections and observations, have the terminal spike wholly staminate, or with a few pistillate flowers at the tip, and belong to the typical variety. We found none with mostly pistillate terminal spikes as in var. *Blakei* Dew.

Frequent on open sandy or rocky shores throughout our region.

Carex stricta Lam.

Including var. *strictior*, Gray's Man.

Amos, nigger-heads on border of *Chamaedaphne* bog, No. 2990; LAO. tussock in crevice at rocky rapids (fruit mature and dropping July 17, 1953), No. 5169; Kap. sandy creek outlet, No. 4867, sedge meadow, old beaver pond, No. 4896, and winter road through old black spruce forest, No. 4968.

Common, often the dominant sedge in wet meadows, forming characteristic stools. Spreading into very wet clearings.

Carex Haydenii Dew.

NL. drainage ditch through bog, No. 2570; LWas. gravelly lake shore, No. 5725; LaS. marsh, No. 2838; LL. lake shore, No. 2798 (with perigynia well grown) and No. 2795 (still in anthesis on same date, June 22, 1952).

These collections were confused in the field with the similar and also common *C. stricta*, and there are, therefore, no field notes on frequency

FESTUCA RUBRA L. Red Fescue

Amos, gravel pit in poplar bush, No. 2998; Tas. gravelly clearing in jack pine forest (spikelets mature August 7, 1953), No. 5429; LaS. road to pasture, No. 2892; Kap. railway ballast, No. 3445, and town park, crevices on rocky river shore, No. 4927.

In the Clay Belt, this widely distributed and highly variable species is evidently not native. The New B. & B. points out that "plants of the coastal region are doubtless native; inland plants may be introduced."

Occasional in dry clearings in the forest, becoming locally common on poor pasture land.

FESTUCA ELATIOR L. Meadow Fescue

LTO. open shingle beach, No. 5239; Coch. vacant lot (spikelets matured July 19, 1952), No. 3391; Kap. clearing in spruce-poplar forest, No. 3521.

Occasionally naturalized around settlements and in clearings and openings in the forest.

PUCCINELLIA NUTTALLIANA (Schultes) Hitchc.

Long. waste land beside railroad (spikelets overmature July 29, 1952), No. 3588.

Collected only once, from a station on the main transcontinental line of the Canadian National Railways, which freight trains pass en route from the western provinces to the eastern seaboard. Adventive from the west and occurring very locally in Eastern Canada. Not reported northward.

Glyceria borealis (Nash) Batchelder

Tas. sandbar at end of bay on L. Berry, No. 5433; LaS. floating margin of cat-tail marsh (spikelets overmature July 17, 1954), No. 5888; Kap. rocky pools at falls, No. 3346; Hst. wet ground, old lumber camp, No. 3820.

Common in shallow water, on marshy shores, and in wet clearings in the forest.

Glyceria melicaria (Michx.) F. T. Hubbard

Sen. shore of boggy pool (long past maturity September 7, 1952), No. 4392. Collected once only, at the southeastern end of our area where this species is at its northern limit of range.

Glyceria canadensis (Michx.) Trin.

VdO. drainage ditch at East Sullivan Mine, No. 3062; Amos, sandy lake shore, No. 2999; Coch. large marsh around small lake (spikelets shedding August 13, 1952), No. 3871; Tim. lumber road through white cedar woods, No. 3999.

Frequent on wet shores, in marshes and wet woods; extending into ditches and wet clearings. Collected northeastward at L. Mistassini by J. M. Macoun, Aug. 24, 1885, but not reported northwest of our region.

Glyceria striata (Lam.) Hitchc.

Including var. *stricta* (Scribn.) Fern.

NL. open drained bog, No. 4545; Amos, wet meadow beside lake, No. 2964; LaS. grazed poplar woods on lake shore, No. 2868; Math. sedge meadow on silt (overmature July 13, 1952), No. 4581; Kap. wet clay, creek-bank, No. 5004.

In our many collections from the Clay Belt it has not proved satisfactory to separate the var. *stricta*. Habit, colour of spikelets, and the breadth of the scarious tip of the lemmas all vary greatly. Fassett (1951) said "There seems to be insufficient correlation of characters to warrant the recognition of var. *stricta*."

Common in all wet places throughout the Clay Belt and abundant in wet meadows. It has remarkable ecological amplitude occurring on boggy as well as clay soils, in the close cover of thickets and woods and on open shores.

Glyceria grandis S. Wats.

NL. roadside ditch through alder thicket, No. 5307; Amos, river shore (inflorescence not yet expanded July 3, 1952), No. 2974; Math. river shore, No. 3255.

Occasional on river shores and wet clearings.

Glyceria Fernaldii (Hitchc.) St. John

G. pallida var. *Fernaldii*, New B. & B.

VM. ditch near dam, No. 4505; Sen. ditch through black spruce forest, No. 4361; Dup. wet lake shore, No. 4235; LaS. floating margin of cat-tail marsh (spikelets mature July 17, 1954), No. 5866; Hst. marshy ground, old lumber camp, No. 3822.

Occasional in shallow water and marshes throughout the Clay Belt, spreading and becoming locally abundant in very wet ditches and marshy clearings.

Poa annua L.

VM. sandy trail through white spruce – aspen poplar forest, No. 4723; Amos, clearing in white spruce forest, No. 2958; Tim. gravelly roadside through field (spikelets mature June 22, 1953), No. 4859.

A common weedy grass throughout the Clay Belt around settlements and on gravelly roadsides, extending into trails and clearings in the forest.

Poa compressa L. Canada Bluegrass

LTO. clearing on lake shore, No. 5243; Amos, roadway through poplar woods (spikelets mature July 5, 1952), No. 3011; IF. railway through young jack pine forest on sand, No. 5033.

Frequent in dry fields of the Little Clay Belt, this introduced grass extends along roadsides and into sandy clearings in the forest throughout our region.

Poa pratensis L. Kentucky Bluegrass

WasL. grassy clearing in aspen poplar – black spruce forest, old campsite, No. 5775; Amos, railway through poplar woods, No. 3008; Coch.

road embankment through marsh (in anthesis July 7, 1953), No. 5026; Math. sandy roadsides through spruce forest, No. 4818; Kap. sandpit in spruce forest, No. 5007.

The above series represents the typical variety with culms 2 to 3 mm. thick at base and broad, flat basal leaves. Gray's Man. states that *P. pratensis* is "indigenous northward, introduced and cultivated southward."

Common along dry roadsides throughout the Clay Belt and frequent in old pasture fields of the Little Clay Belt. Extending along forest roads into clearings and old settlements.

Arnt. sandy trail through poplar woods (in anthesis June 20, 1952), No. 2753; IF. railway through young jack pine forest on sand, No. 5032; Kap. open rocky ledges above Remi L., No. 4889.

These specimens have thinner, firmer culms than the typical variety with involute, slender leaves, placing them with var. *angustifolia* (L.) Sm. which is treated as a separate species in Gray's Man.

The variety occurs in similar dry, open habitats, but less frequently than the typical.

Poa trivialis L. has been grown successfully in lawn grass test plots by Mr. K. G. Coates at the Dominion Experimental Station, Kapuskasing, Ont., but we did not see it elsewhere in the Clay Belt.

Poa saltuensis Fern. & Wieg.

NL. young birch-poplar woods on wet limestone, No. 2481, and poplar-spruce woods in clay-banked ravine, No. 2696; WasR. wet aspen poplar–birch woods, No. 5791; VdO. birchwoods on sandy shore (spikelets mature July 8, 1952), No. 4573; LL. roadside through spruce-poplar forest, No. 2727; Math. clearing around old camp, No. 3161; Tim. aspen poplar–spruce woods, No. 4850.

Frequent in deciduous woods throughout the Clay Belt, and less commonly in mixed deciduous-coniferous forest and damp clearings. Not reported northward.

Kap. old aspen poplar woods, No. 4954.

This specimen is distinctly smaller throughout than the typical variety having spikelets less than 3.5 mm. and lemmas less than 3 mm. long, placing it with var. *microlepis* Fern. & Wieg. in the treatment of Gray's Man.

The variety collected but once in our area.

Poa nemoralis L.

NL. rocky outcrop, No. 2674; Dup. open rock hummock, No. 4129; Arnt. crevices on rockface of Cheminis Hill, No. 2741; Kap. rocky outcrop at falls (spikelets mature July 26, 1952), No. 3557.

This material belongs to the exceedingly complicated *P. nemoralis-P. glauca* group. The collections were made at undisturbed habitats, not around settlements, and therefore are probably native and are not introduced. The taxonomic difficulties discussed by Butters and Abbe (1917) are too great to warrant more precise naming of these Clay Belt specimens.

Occasional on open rocky places where it is locally abundant.

Poa palustris L.

LWas. grassy clearing in aspen poplar – black spruce forest, old camp-site, No. 5776; OttR. ashwoods on low lake shore, No. 5835; Amos, clearing in white spruce woods, No. 2959; LAO. young, ungrazed forest following partial cutting, No. 2867; IF. alder-willow thicket on clay shore of Nellie L., No. 5044; Coch. shore of small sandy lake (spikelets mature August 10, 1952), No. 3866; Math. shore thickets (in anthesis July 17, 1952), No. 3267; LKap. rocky point, red pine stand, No. 6051.

Abundant in wet ground throughout the Clay Belt in a wide variety of habitats as given in the above selection of representative specimens.

The Clay Belt lies within the range of *Poa alpina* L. The most likely places within our region are the calcareous area of L. Timiskaming and L. Waswanipi, and the high rocky hills of northern Quebec. The nearest record to the Clay Belt was collected eastward at L. Albanel by Rousseau & Rouleau, No. 1489.

For *Poa glauca* Vahl *see* under *P. nemoralis* above.

DACTYLIS GLOMERATA L. Orchard Grass

NL. old field (in anthesis June 17, 1952), No. 2662; Coch. railway yards, No. 3392; Kap. town park, grassy clearing on river-bank, No. 4924.

This material has glumes and lemmas pubescent on the back, which places with it var. CILIATA Peterm. in the treatment of Gray's Man.

Occasional in old fields and waste places. Not reported north of our area.

Phragmites communis Trin.

VM. marsh at end of L. Laperrière, No. 4523; VdO. sandy shore of L. Blouin, No. 3037; Arnt. sandy shore of L. Opasatica, No. 2785; Tim. shore of Porcupine L., No. 4027; Hst. marsh at outlet of Forde L. (inflorescence fully expanded August 3, 1952), No. 3725; LKap. marshy river shore, No. 6087.

Occasional on marshy and sandy shores of lakes and rivers. Apparently not setting good seed. Our material is var. *Berlandieri* (Fourn.) Fern. Reported northward in the Precambrian zone by DLD.

Agropyron trachycaulum (Link) Malte

Math. sandy road through poplar woods, No. 4588; Kap. meadow, river-bank, No. 3378, and clearing at falls (in late anthesis July 20, 1952), No. 3338.

The above specimens have the scarcely imbricated spikelets of the typical variety. Occasional on river-banks and found once, somewhat depauperate, on woodland road.

VdO. sandy shore of L. Blouin (in anthesis July 11, 1952), No. 3089.

This specimen has the short-awned lemmas, overlapping spikelets, and glumes more than 10 mm. long of var. *majus* (Vasey) Fern.

Collected only once and apparently rare.

Math. flood meadow below falls (in anthesis July 13, 1952), No. 3168; Kap. meadow, river-bank, No. 4600, and rocky river-bank, No. 4659; Long. sandy lake shore, No. 3658.

This material has the short-awned lemmas, overlapping spikelets, and glumes less than 10 mm. of var. *novae-angliae* (Scribn.) Fern.

Occasional on open shores and meadows.

Hail. old camp-site, river-bank, under yellow birch, No. 5376; LTO. open shingle beach, No. 5223; Coch. rocky shore at falls on Frederick House R., No. 3953.

These have long awns on the lemmas and glumes less than 12 mm. long placing them with var. *glaucum* (Pease & Moore) Malte.

Occasional on open rocky shores and clearings.

Kap. aspen poplar woods, river shore, No. 3374.

Although not fully mature, this specimen has awns up to 30 mm. long with correspondingly long glumes and thick spikes. It is therefore referred to var. *unilaterale* (Cassidy) Malte.

Seen only once and apparently rare.

This species and its varieties find little favourable habitat in the Clay Belt where they occur occasionally on open dry shores and clearings.

AGROPYRON SMITHII Rydb. Western Wheat Grass

Coch. railway yards (spikelets fully grown August 11, 1952), No. 3908.

This adventive from the west was found only once in the Clay Belt growing in a large colony on railway yard cinders. Not reported northward.

AGROPYRON REPENS (L.) Beauv. Couch Grass

VM. ditch to lake shore through fields, No. 5979; Arnt. sandy shore of L. Opasatica, No. 2781; IF. railway through young jack pine on sand, No. 5035.

These specimens have glumes abruptly narrowed to apex, rachis glabrous except for ciliate edges and short-tipped awns and belong to the typical variety.

Coch. road embankment through marsh (in anthesis July 7, 1953), No. 5025.

This specimen has the awned lemmas of forma ARISTATUM (Schum.) Holmb.

Common as a troublesome weed of gardens and fields. Occurring also on roadsides and spreading infrequently to sandy shores. Evidently an introduced weed in the Clay Belt but apparently indigenous along the North Atlantic coast according to the New B. & B.

HORDEUM JUBATUM L. Wild Barley

NL. railway yards (spikelets mature July 29, 1953), No. 5357; VM. gravelly roadside through birch-maple woods, No. 5972; Math. sandy roadside, No. 3200.

Common on sandy and gravelly waste land. Forming a conspicuous border for many miles along dry roadsides. May become a troublesome weed if the current increase in beef cattle develops grazing on a large scale in the Clay Belt.

HORDEUM VULGARE L. Barley

Coch. railway yards, No. 3403; Long. railway embankment (not yet ripe July 29, 1952), No. 3598.

Cultivated on a minor scale in our region, with about 6,000 acres sown. Barley escapes repeatedly along railways and on farm roads but does not apparently persist.

TRITICUM AESTIVUM L. Wheat

Coch. railway ballast, No. 3401; Long. railway embankment (not yet ripe July 29, 1952), No. 3597.

Cultivated as a minor crop in the Clay Belt with a little over 3,000 acres sown. Wheat escapes repeatedly along railways from the heavy western grain shipments.

SECALE CEREALE L. Rye

Dup. neglected field, No. 4203; Long. railway embankment, No. 3580.

Cultivated on a very minor scale in our area. Rye is also sown on the sides of new highways. Forming very poor heads when growing without cultivation along railways and on waste land.

Although *Elymus arenarius* L. var. *villosus* Mey. (*E. mollis*, New B. & B.) grows on the north shore of L. Superior and north of our area in James B., it is unlikely that this strand plant will be found within the Clay Belt.

Elymus virginicus L.

LTQ. creek outlet at lake, No. 4404; Math. creek outlet at Black R., No. 3277.

These specimens have the base of the spike included or but little exserted from the sheath and therefore represent the typical variety.

Occasional and apparently preferring a more open habitat than var. *jejunus*.

NL. elm-ash woods on hillside (in late anthesis July 21, 1953), No. 5207; LTQ. lakeshore ashwoods, No. 5277; Coch. bank of Buskegau R., No. 3880.

This material has the base of the spike well exserted from the scarcely inflated uppermost sheath, placing it with the var. *jejunus* (Ramaley) Bush which, through intermediates, does not seem very distinct.

Frequent in low elm-ash woods of the L. Timiskaming area, though rare elsewhere in the Clay Belt.

ELYMUS MACOUNII Vasey

Kap. railway embankment, No. 3489; Long. railway embankment (spikelets still immature July 29, 1952), No. 3587.

Rare and found only on railroads which probably brought it to the Clay Belt so far east of its prairie range. However, both of the suggested parents (*Agropyron trachycaulum* and *Hordeum jubatum*) of this supposed hybrid do occur in our area. Evidently a local adventive in our region, not listed in neighbouring regions nor reported east of our records.

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Elymus canadensis L.

Kap. sandy shore of small lake (in late anthesis July 24, 1952), No. 3479.

Rare. Seen only once in our region.

ARRHENATHERUM ELATIUS (L.) Mert. & Koch

Kap. roadside through farmstead (not yet mature July 5, 1953), No. 5024.

This specimen has the pale panicles which distinguish forma FLAVESCENS (P. Nielsen) Holmb.

Rare. Seen only at the Dominion Experimental Station where it undoubtedly escaped from an incoming shipment. Not previously reported so far north in this longitude.

Sphenopholis intermedia Rydb.

VM. birch-maple woods on lake shore, No. 5953; Math. flood meadow below falls, No. 3167; Kap. grassy shore of small lake (spikelets mature July 24, 1952), No. 3478.

Occasional in deciduous woods and wet meadows throughout the Clay Belt.

Trisetum spicatum (L.) Richter

NL. crevices on rock cliffs at falls, No. 5327; LWas. bare gravelly hillock (in late anthesis June 26, 1954), No. 5723; Dup. rock outcrop above rapids, No. 4128; LAO. open rocky shore, No. 5072; LKap. rocky point, red pine stand, No. 6050; Kap. rocky shelf above falls, No. 3534.

These specimens and all other collections and observations had the silvery-green panicle with glabrous glumes of var. *molle* (Michx.) Beal.

Occurring throughout the Clay Belt wherever there are dry, open, rocky or gravelly habitats and there locally abundant and a characteristic grass of these infrequent sites.

Trisetum melicoides (Michx.) Vasey

Kap. rocky shore of Kapuskasing R. near the town (spikelets mature July 20, 1952), No. 3320.

Some of the sheaths are pilose, and the lemmas are awnless placing it with var. *majus* (Gray) Hitchc.

Recognized only once in the field and apparently rare, though it may have been overlooked in mistake for other grasses with loose and open panicles such as *Sphenopholis intermedia*.

AVENA FATUA L. Wild Oats

Dup. old field, No. 4201; Long. railway embankment (mature July 29, 1952), No. 3599.

Found rarely in the Clay Belt in neglected fields, on railways and roadsides. Oats is the main cereal crop in our region, but wild oats was not seen in quantities large enough to rate as a bad weed locally. Not reported north of our region, though it may occur in clearings around trading posts where grain has been cultivated.

AVENA SATIVA L. Oats

Dup. old field (mature August 23, 1952), No. 4202; Coch. railway yards, No. 3395.

The main cereal crop plant of the Clay Belt, far outranking any other. Over 90,000 acres are sown to oats covering nearly 20 per cent of the cleared farm land. It frequently escapes to waste land, roadsides, and railways. It is also found along trails in the forest surprisingly remote from settlement. This is doubtless explained by the use of horses for skidding logs.

Deschampsia flexuosa (L.) Trin.

Amos, on sand in jack pine forest, No. 2918, and sandy roadside through rocky outcrop (in anthesis July 3, 1952), No. 2969; Tas. sandy blowout in jack pine forest, No. 4270.

Rare and found only in the northern Quebec portion where it formed characteristic colonies around open windblown places in dry, sandy, jack pine forest.

Deschampsia caespitosa (L.) Beauv.

Math. sedge meadow on silt (in anthesis July 13, 1952), No. 3114.

This specimen is a robust plant whose measurements match var. *genuina* Gran. & Godr. in Fassett's (1951) treatment.

Collected only once in the Clay Belt. It is interesting to read Fassett's comment concerning the occurrence of var. *genuina* in Wisconsin: "It is perhaps significant that these stations are on the bed of Glacial Lake Oshkosh."

NL. open, alluvial shore of Elk L., No. 5300; BellR. grassy clearing at end of portage (in anthesis July 7, 1954), No. 5820; Coch. rocky shore at falls on Frederick House R., No. 3951; Kap. rocky river shore, No. 3330.

These represent the more delicate var. *glauca* (Hartm.) Lindm. f. which occurs occasionally in the Clay Belt on rocky shores and damp rivershore meadows.

Danthonia spicata (L.) Beauv.

Hail. old camp-site, river-bank, under yellow birch, No. 5377; Amos, sandy roadside through rock outcrop, No. 4660, and young aspen woods (past maturity August 5, 1953), No. 5404; OttR. clearing on river-bank, No. 5852 and rocky lake shore, Nos. 5845 and 5842; LL. on sand, road through jack pine forest, No. 3095.

This series varies considerably. The glumes taper from near base and have strong lateral veins as in the typical variety in the treatment of Gray's Man.

Arnt. crevices on rock face of Cheminis Hill (culms halfgrown June 20, 1952), No. 2748; Math. on sand, open jack pine forest after burning, No. 3216.

These specimens have glumes tapering from above the middle with weak lateral veins, and the leaves are less curved and twisted. They have been referred, with some misgivings, to var. *pinetorum* Piper, which is the northern plant according to Gray's Man.

This species is frequent throughout the Clay Belt in a variety of habitats from dry, open, deciduous woods and jack pine forest to exposed rocky cliffs.

Danthonia ?Alleni Aust.

Tas. sandy roadside through willow thicket (past maturity August 7, 1953), No. 5445; Kap. rocky river-bank, No. 3321.

These specimens possibly belong to the series which is called "perplexing" in Gray's Man., for which Fassett (1951) used the term "dubious," and which is not mentioned in the New B. & B.

Collected at two widely separate localities in the Clay Belt. Not reported northward nor in adjacent areas.

Calamagrostis canadensis (Michx.) Nutt.

NL. river bar on boulders, No. 5288; VdO. ditch at railway station (in anthesis July 10, 1952), No. 3084; LAO. sandbar, No. 5545, and rocky islet, No. 5121; Math. ravine, poplar woods, No. 3236.

The series above have smaller spikelets with the dimensions and shape of the typical variety.

NL. river bar on boulders, No. 5286; VdO. birch-spruce woods on lake shore, No. 3040; Amos, lakeshore alder thickets, No. 5392; Kap. creek-bank, *Myrica* thicket, No. 6107.

These specimens have the larger spikelets with the dimensions and acuminate glumes of var. *robusta* Vasey, which grades imperceptibly into the typical form (Stebbins, 1930). Both varieties were found in the Clay Belt growing together in the same places. Fassett's (1951) classification of measurements of spikelets in Wisconsin material gave a normal frequency distribution curve for the above varieties and var. *Macouniana* (Vasey) Stebbins and showed "that these varieties are not distinct entities" in Wisconsin.

This species is common throughout the Clay Belt and is the characteristic grass of open low shores of rivers and lakes. It occurs also in open damp woods, ditches, and wet clearings.

Calamagrostis inexpansa Gray

Math. on sand, road through jack pine forest (in anthesis July 16, 1952), No. 3214; Coch. railway yards, No. 3405; Kap. rocky shore at falls, No. 3537, and meadow around creek, No. 3435; Hst. clearing around fire-tower, No. 3766; Long. road through jack pine forest, No. 3671, and sandy clearing, No. 3606.

All this material has the scabrous foliage and erose ligules of this very variable species, though some of it (Nos. 3405 and 3537) superficially resembled the similar species, *C. neglecta* (Ehrh.) Gaertn. The panicles are compact with spikelets having the dimensions of var. *brevior* (Vasey) Stebbins.

Common throughout the Clay Belt on somewhat drier ground than *C. canadensis* and found frequently in clearings and especially openings in the jack pine forest.

Agrostis alba L. Redtop and Creeping Bent

Including *A. stolonifera* L.

VM. wet sandy clearing in birch woods (in anthesis July 19, 1954), No. 5936; LTO. open shingle beach, No. 5227; LL. on sand, road through jack pine forest, No. 3094; IF. railway through young jack pine forest on sand, No. 5036; Kap. rivershore thickets near the town, No. 3315.

According to Gray's Man., redtop is indigenous northward in such places as damp thickets, swales, and shores, and introduced in fields and on roadsides. It is abundant in the Clay Belt in fields, common on roadsides and clearings, and occasional in thickets and shores.

Hail. open rocky bank of Montreal R., No. 5369; NL. grassy sward on cinders between tracks, railway yard, No. 5359; LAO. grassy clearing, rivershore settlement (in anthesis July 13, 1953), No. 5087; Math. sedge meadows, on silt around small lake, No. 3119.

This series has the matted habit and compact panicle which distinguish the creeping bent, var. *palustris* (Huds.) Pers. (*A. stolonifera* var. *compacta,* New B. & B.).

Occasional in marshes and shores, where sometimes it appears to be indigenous in the Clay Belt (Nos. 3119 and 5369), and found occasionally also in wet clearings at settlements.

Agrostis tenuis Sibth.

Dup. rocky outcrop (long past maturity August 20, 1952), No. 4137.

Recognized at only one place in the Clay Belt and apparently rarely established in our area. Not reported northward.

Agrostis scabra Willd.

VdO. sandy lake shore, No. 3039; Amos, roadside through poplar woods, No. 3019; LAO. 2-year-old burn of black spruce – jack pine forest (in anthesis July 14, 1953), No. 5103; Coch. shore of small sandy lake, No. 3865.

Occasional on sandy shores and rock outcrops, and in dry openings in the forest.

Cinna latifolia (Trev.) Griseb.

NL. elm-ash woods on hillside (in anthesis July 21, 1953), No. 5203; VdO. birch-poplar woods, No. 3042; Amos, young birch – balsam fir woods, No. 5413; Coch. spruce-poplar woods, No. 3979.

Occasional in moist deciduous woods, more frequent in the L. Timiskaming portion of the Clay Belt.

Phleum pratense L. Timothy

NL. roadside through poplar woods, No. 2679; OttR. roadside flanking rock knob, No. 5840; Kap. river-bank near the town (in anthesis July 20, 1952), No. 3326.

Commonly planted, and is grown for seed in the L. Timiskaming portion of the Clay Belt. Timothy is an important constituent of the

excellent hay crops of our area. This accounts for its widespread occurrence on roadsides and far into the forest, where it is taken to feed the horses working on pulpwood operations.

ALOPECURUS PRATENSIS L.

NL. old field (in anthesis June 17, 1952), No. 2663; Math. beside creek, No. 3176.

Found rarely in old fields and wet meadows. Not reported north of our region.

Alopecurus aequalis Sobol.

LaS. road culvert (in anthesis June 29, 1952), No. 2886; LAO. rocky islets, No. 5122; Hst. silted lake shore, No. 3812; Kap. wet trail through spruce-poplar forest, No. 4953.

Occasional on low wet shores and extending into wet clearings in the forest and farm lands.

A collection from Renison on the Moose R., Hustich & Tuomikoski, No. 55, was called *Muhlenbergia Richardsonis* (Trin.) Rydb. This locality lies north of the Clay Belt, 156 miles down the Ontario Northland Railway from Cochrane to Moosonee. This specimen might be the western *M. squarrosa* (Trin.) Rydb., to which W. G. Dore revised specimens collected by Dutilly & Lepage at Albany (No. 15.954). This species may occur within the margins of our region.

Muhlenbergia mexicana (L.) Trin.

LTQ. open rocky shore, No. 4472; Dup. shore of sand and boulders, No. 4154; Coch. rocky shore at falls, No. 4625; Kap. rocky shore at falls (in late anthesis July 26, 1952), No. 3548.

This material has the awnless glumes and lemmas of the typical form.

Occasional on rocky shores throughout the Clay Belt especially where there are shelves of rock near falls. Often growing with *M. glomerata*. Reported northward on the Albany R. by DLD as apparently at its northeastern limit.

Hail. river shore above boulders (in late anthesis July 31, 1953), No. 5381.

This specimen has the very long-awned lemmas of forma *ambigua* (Torr.) Fern.

The forma *ambigua* was seen only once in the L. Timiskaming portion of the Clay Belt.

Muhlenbergia glomerata (Willd.) Trin.

M. racemosa, Gray's Man. ed. 7, New B. & B.

LTO. open, shingle beach (in anthesis July 21, 1953), No. 5225; LTQ. open, rocky lake shore, No. 4492; Sen. rocky shelves at rapids, No. 4354; Dup. lake shore, boulders and sand, No. 4144; Kap. rocky shore at falls, No. 3546; Long. damp silted shore, No. 3624.

This series and all other collections and observations in the Clay Belt have the scattered leaves, interrupted panicle and glumes with merely scabrous keels and awns which distinguish var. *cinnoides* (Link.) F. J. Herm. in the treatment of Gray's Man.

Occasional on open, rocky, and wet shores throughout the Clay Belt. Often growing with *M. mexicana*.

Muhlenbergia uniflora (Muhl.) Fern.

Tas. silted bay of sandy lake (overmature August 31, 1952), No. 4334.

Collected only once and apparently rare, although it may have been overlooked for habitally similar species of *Panicum*. This species, reported at Batchawana on L. Superior by Taylor, evidently does not extend north of the Clay Belt.

Brachyelytrum erectum (Schreb.) Beauv.

Hail. old camp-site, river-bank, under yellow birch (spikelets fully grown July 31, 1953), No. 5375; VM. lake shore, poplar-red maple woods, No. 5973; Sen. river shore, No. 4345; Tas. lake shore, No. 4249.

All these collections have the glabrous lemmas of the more northern var. *septentrionale* Babel.

Occasional in the L. Timiskaming portion of the Clay Belt, rare northward. Occurring in woods on shores of rivers and lakes. Not reported north of our region.

Oryzopsis asperifolia Michx.

LTQ. rocky crevices in open red pine wooded hillside, No. 4698; LTO. woodland trail along shore, No. 2517; Amos, foot of rock knob (a few stamens still remaining June 8, 1954), No. 5675; Math. opening in forest on rocky hillside (spikelets mature June 19, 1953), No. 4822.

Frequent throughout our region in dry woods.

Oryzopsis pungens (Torr.) Hitchc.

VM. gravelly trail through pine woods (in late anthesis June 7, 1953), No. 4710; LMat. rock crevices on summit of Mt. Laurier, No. 5807; LAO. 2-year-old burn of black spruce–jack pine forest, No. 5104; Math. sandy roadside through jack pine forest, No. 4828.

Frequent throughout the Clay Belt in sandy jack pine forest and open rock exposures. Becoming locally abundant after cutting or fire in pineries and spreading along roadsides in sandy jack pine forest.

Oryzopsis canadensis (Poir.) Torr.

LMat. rock crevices on summit of Mt. Laurier, No. 5807; Amos, on sand in jack pine forest, No. 2905; LL. on sandy jack pine forest, No. 2791; Math. flood meadow below falls (spikelets mature July 13, 1952), No. 3165.

Less frequent than *O. pungens* but often occurring with it and generally in the same habitats.

Milium effusum L.

NL. young birch-poplar woods on wet limestone (in late anthesis June 11, 1952), No. 2476.

Rare. Found only once in the Little Clay Belt and here at the northern limit of its range for this longitude.

Spartina pectinata Link

Hail. open river-bank among boulders (in late anthesis July 31, 1953), No. 5371; LTQ. open rocky shore, No. 4476; Coch. rocky shore of Buskegau R., No. 3984, and of Frederick House R., No. 3955; Kap. rocky shelf on river shore, No. 3503.

Occasional in the southern and western portions of the Clay Belt. Found on open, low, rocky shores of rivers and lakes which is an infrequent habitat in our area.

Beckmannia syzigachne (Steud.) Fern.

LAO. grassy clearing at river-bank at Lowbush townsite (in anthesis July 13, 1953), No. 5084; Math. damp river shore near townsite, No. 3263; Gog. near townsite, lakeshore side of cat-tail marsh (spikelets mature July 24, 1954), No. 5995; Kap. excavation at airport, No. 3443.

Occasional near townsites and apparently adventive in wet clearings and marshy shores. This species has been collected north of our area in Ontario up to James B. In Quebec it was recorded only from Abitibi and the Isle of Orleans according to Victorin's (1935) "Flore Laurentienne."

Phalaris arundinacea L.

VM. ditch to lake shore through fields, No. 5978; Math. shore of small sandy lake (in anthesis July 13, 1952), No. 3128; Gog. large marsh bordering creek, No. 6036; Kap. creek-bank, *Myrica* thicket, No. 6106.

Occasional throughout our region on wet open shores.

NL. abandoned farmstead, No. 2664; Coch. railway yards, No. 3393.

The white-striped ribbon-grass, forma variegata (Parnell) Druce, (var. *picta*, New B. & B.) rarely persists in abandoned gardens in our area and escapes into waste land.

Hierochloë odorata (L.) Beauv.

LWas. sandy beach (in late anthesis June 28, 1954), No. 5764; Kap. winter road through black spruce forest, No. 4987; Long. public beach on Kenogamissis Lake, No. 3659.

Rare, found at three widely separated places in the Clay Belt on sandy beaches and in an opening of the black spruce forest.

Zizania aquatica L.

Tim. marshy backwater of Frederick House R., No. 4023, and shore of small lake, No. 4063; LKap. marshy river shore (past anthesis July 29, 1954), No. 6071; Hst. silted shore of Lake Ste. Thérèse, No. 3786; Ger. one foot of water off *Equisetum fluviatile* marsh, No 6136.

All this material has the coarsely corrugated lemmas and narrow leaves of var. angustifolia Hitchc.

Occasional in shallow water and off marshes in the northern Ontario portion of the Clay Belt. Two of these collections, Nos. 3786 and 6071, came from colonies that were certainly planted. The other colonies were probably planted by duck-hunters, and it is very doubtful whether there is any naturally occurring wild rice in our area. DLD reported an isolated station north of our region at L. Hail., lat. 51° 58′ N., long. 88° 15′ W.

PANICUM CAPILLARE L.

Kap. railway ballast (immature July 22, 1952), No. 3444.

Seen only as a weed on railway ballast and not elsewhere in the Clay Belt. Reported north of our region on the Albany R. by DLD.

The var. *occidentale* Rydb. has also been reported north of our area on the Albany R. by DLD.

PANICUM PHILADELPHICUM Bernh.

Dup. clearing around cottages (mature August 20, 1952), No. 4110 (det. W. G. Dore).

Collected only once in our area where this species is probably adventive from the south following the settlement of the forest. Not reported northward.

Panicum virgatum L. occurs in southern Ontario and Quebec. It has also been reported northward on the Albany R. by DLD. It is possible that this species may also turn up in the Clay Belt.

Panicum depauperatum Muhl.

Tas. on sand, in jack pine forest (vernal inflorescences empty, autumnal appearing at base August 29, 1952), No. 4278; Math. sandy roadside through jack pine woods, No. 4829, and in same habitat (vernal inflorescences mature July 16, 1952), No. 3215.

This material has the glabrous sheaths of the more northern var. *psilophyllum* Fern.

Occasional in sandy openings in jack pine forest. Not reported north of our region.

Panicum lanuginosum Ell.

The Clay Belt collections of this most variable species are, for the present, referred to three of the intergrading varieties of the treatment in Gray's Man.

Amos, on sand in jack pine forest, No. 2901; LL. on sand, road through jack pine forest, No. 3096; Math. sandy clearing around camp, No. 4583, and on sand, jack pine forest, No. 3218; Gog. sandy trail through birch-poplar woods, No. 6032.

All but No. 6032 of the above series were determined by W. G. Dore as var. *fasciculatum* (Torr.) Fern. This variety is probably at its northern limit in our region.

OttR. rocky lake shore, No. 5865; Amos, gravelly shore of clear lake, No. 5468; Math. sandy bank, No. 3150; LKap. sandy road through jack pine forest, No. 6089.

The above collections have been referred to var. *implicatum* (Scribn.) Fern. This variety has been reported north of our area at Martin Falls on the Albany R. by DLD.

The two preceding varieties were not distinguished in the field. They were found commonly in sandy jack pine forest and on rocky and gravelly shores.

LTQ. open rocky shore, No. 4494 (det. W. G. Dore); Hail. gravelly river shore, No. 5364; LTO. shingle beach in front of cedar woods, No. 5221.

These specimens with glabrous sheaths have been referred to var. *Lindheimeri* (Nash) Fern.

Locally common on open, rocky, and gravelly shores around L. Timiskaming, where this variety probably reaches its northern limit.

Panicum columbianum Scribn.

Including *P. tsugetorum* Nash

Tas. on sand, jack pine forest, No. 4279 (det. W. G. Dore as *P. tsugetorum*).

This specimen has the prolonged first glume and finely puberulent panicle axis, which distinguish this species from the similar *P. lanuginosum*.

Notes on frequency and habitat lacking, because this species was not certainly recognized in the field. It may have been overlooked in mistake for the commoner varieties of *P. lanuginosum*. Not reported northward.

Panicum xanthophysum Gray

Kap. sandy bank at town park and river shore, No. 3501.

Seen only once in a park, where it may have been introduced with garden material. Not reported north of our region.

Echinochloa crusgalli (L.) Beauv. Barnyard Grass

This species was collected on a weed survey of the Clay Belt at Amos by H. Groh, Sept. 6, 1938 (DAO). Barnyard grass was entered in our field notebook in the L. Timiskaming area, but, unfortunately, no collection was made to distinguish it certainly from the following species. Not reported northward.

Echinochloa pungens (Poir.) Rydb. Barnyard Grass

Dup. clearing around cottages (spikelets mature August 20, 1952), No. 4368 (det. W. G. Dore).

This specimen has the greenish tip of the fertile lemma firm and grading into the body. This is the character, which, according to Fassett (1951), must be used to distinguish var. *Wiegandii* Fassett of this species from the very similar *E. crusgalli* (L.) Beauv.

Collected only once as a weed in a clearing. This native North American plant is probably adventive from the south coming in with the settlement of the Clay Belt. Not reported northward.

Setaria glauca (L.) Beauv. Yellow Foxtail

Tim. vacant lot (mature August 19, 1952), No. 4634.

A rare weed in the Clay Belt. Not reported northward.

Setaria viridis (L.) Beauv. Green Foxtail

Amos, railway yards in town (mature August 16, 1953), No. 5496.

Like the preceding species a rare weed in the Clay Belt. Not reported northward.

Andropogon Gerardi Vitman occurs in southern Ontario and Quebec. It has also been reported north of our region on the Albany R. by DLD. These authors remark: "Sa présence dans cette section de la rivière Albany suggère une migration de la région des Grands Lacs par la voie des rivières Ghost ou Kenogami." The Clay Belt lies on this route. This species should be placed on the list of possibilities, though we saw it nowhere in our region.

There were no observations of ZEA MAYS L. growing without cultivation in our area. Corn is a very minor crop plant in the Clay Belt, only 50 acres being sown in 1954 in the Ontario districts of Timiskaming and Cochrane.

CYPERACEAE

Dulichium arundinaceum (L.) Britt.

Amos, marsh bordering sluggish stream, No. 5456; Dup. loamy margin of shallow lake, No. 4223; Tim. sedge meadow around bog, No. 4075: Gog. silted shore of small lake (in anthesis July 26, 1954), No. 6039.

Occasional on silted shores, marshes, and boggy meadows. Not reported north of our region.

Eleocharis Robbinsii Oakes has been collected just south of the Clay Belt; shallow muddy bays, Temagami Forest Reserve, W. R. Watson, No. 442. It probably does occur within our area, most likely in the L. Timiskaming portion.

Eleocharis pauciflora (Light.) Link

NL. open alluvial shore, No. 5298; Math. sedge marsh on silt (achenes fullgrown July 13, 1952), No. 3126; Long. silted shore, Nos. 3636 and 4657.

This American var. *Fernaldii* Svenson of the circumpolar species is frequent on silted shores of small lakes and open alluvial shores.

Eleocharis acicularis (L.) R. & S.

Amos, mud flat, silted shore, No. 5417; Dup. lake shore, silted bay, No. 4656; LAO. rocky islet (in anthesis July 15, 1953), No. 5123; Kap. shore of small lake, No. 3448.

The above series belongs to the typical variety.

Kap. pool on river shore, sterile (det. A. E. Porsild as to species), No. 3540, and rocky pool on river shore, fertile, No. 4944.

These specimens, growing in shallow rivershore pools, have many, long, delicate culms. This state has been separated as forma *longicaulis* (Desmaz.) Hegi in Gray's Man.

Sen. shallow water of sandy lake, No. 4377.

This submersed collection is sterile and very dwarf. It has smooth, fleshy, transparent culms with long rhizomes placing it with var. *submersa* (Hj. Nilss.) Svenson in the treatment of Gray's Man.

A frequent species of silted shores in the Clay Belt.

Eleocharis obtusa (Willd.) Schultes has been reported at Batchawana by Taylor and collected farther north along L. Superior at Michipicoten by Hosie, Harrison & Hughes, No. 1175. The range of this species may extend to the southern margin of the Clay Belt.

Eleocharis ovata (Roth) R. & S.

Dup. lake shore, silted bay (ripe achenes dropping August 20, 1952), No. 4107; Tas. alluvial river shore, No. 4298.

These mature specimens key out well to *E. ovata*. The arching, crowded culms of very different lengths place them with var. *Heuseri* Uechtritz in the treatment of Gray's Man.

Found only twice on silted shores, and not reported north of our region.

Eleocharis palustris (L.) R. & S.

Amos, silted, sandy lake shore (achenes mature August 4, 1953), No. 5398; Dup. alluvial shore, No. 4229; Coch. marshy shore, No. 3892; Hst. river shore, No. 3706; Long. silted shore, No. 3638.

These collections have the dimensions of the typical variety in the treatment of Gray's Man. The New B. & B. treats *E. Smallii* Britt. here also.

Common throughout the Clay Belt on silted, sandy, and marshy shores.

Tas. lake shore (fullgrown achenes August 26, 1952), No. 4245; Hst. silted lake shore, No. 3811.

These specimens have the dimensions of var. *major* Sonder given in Gray's Man.

This variety less frequent than the typical and growing in the same kind of habitats.

Eleocharis ?calva Torr.

Long. control dam on Kenogami R., No. 3663.

This specimen is too immature (July 31, 1952) for certain determination. It seems to match specimens of *E. calva* whose range includes the Clay Belt.

Eleocharis uniglumis (Link) Schultes

Dup. lake shore, silted bay (achenes mature August 20, 1952), No. 4113; Hst. marshy ground at old lumber camp, No. 3836; Kap. shore of sandy pond, No. 3471.

This northern species occurs occasionally in our region on shores and wet places.

Eleocharis nitida Fern.

Amos, wet meadow, L. Fontbonne (in anthesis July 3, 1952), No. 2966.

There are only a few collections of this rare species from Eastern Canada. It has been found previously in the Clay Belt: dans les ornières d'un chemin abandonné, dans la forêt de *Pinus Banksiana,* bassin de la rivière Ottawa, 122 miles au nord de Mont-Laurier, Marie-Victorin, Rolland Germain & Blain, No. 48. Not reported northward.

Eleocharis compressa Sulliv.

Tim. boggy shore of small lake, No. 4010.

This collection, though still immature August 15, 1952, matches specimens of this species.

The frequency of this and other habitally similar species in the Clay Belt was not estimated, because they were not certainly distinguished in the field. The var. *atrata* Svenson was reported at Moosonee on James B. by DLD.

Eleocharis elliptica Kunth

Math. marshy shore of small lake, No. 3147, and river shore, No. 3254; Long. silted shore, No. 3637.

The yellow achenes were sufficiently developed by July 13, 1952, No. 3147, to give good determination of this species. DLD report it at Attawapiskat on James B. as probably at its northeastern limit.

Scirpus Clintonii Gray

BellR. open rocks beside rapids (spikelets mature July 6, 1954), No. 5814; Sen. rock exposure beside river, No. 4363; Tim. lake outlet, rock outcrop, No. 3990, and open rocky shelves at falls of Godfrey Creek (spikelets fullgrown June 21, 1953), No. 4856.

Apparently rare in the Clay Belt, although it may have been overlooked after the spikelets matured and dropped when the plants had lost their distinctive appearance. *S. Clintonii* was always found growing alone and only in crevices on rock exposures near rapids. This special habitat is infrequent in our area but common in the surrounding Precambrian country, which was not covered by the waters of glacial Lake Barlow-Ojibway. Rarely collected in Eastern Canada. Reported (with map) north of our region on the Harricanaw R. by Dutilly and Lepage (1952).

Scirpus caespitosus L.

S. caespitosus var. *callosus,* Gray's Man., New B. & B.

Long. silted shore of Phipps L. (overmature July 30, 1952), No. 3620.

Seen only once in the Clay Belt, this species is common northward in James B. Southward it was collected frequently by Taylor, Hosie *et al.* on the north shore of L. Superior. Our material is ssp. *austriacus* (Palla) Aschers & Graebn.

Scirpus hudsonianus (Michx.) Fern.

Amos, open thickets around silted lake (in anthesis June 9, 1954), No. 5678; LaS. bog, black spruce woods, No. 2887; LL. boggy lake shore, No. 2728; Math. sedge meadow on silt, No. 3127; Kap. highway ditch through black spruce forest (shedding ripe achenes July 22, 1952), No. 3432.

Occasional on silted shores, sedge meadows, boggy openings in the forest, ditches, and wet clearings.

Scirpus subterminalis Torr. was collected about 25 miles south of our area at Bear I., Temagami, by W. R. Watson, August 13, 1922, and probably will be found in the nearby L. Timiskaming portion of the Clay Belt. The same probability exists for *S. Torreyi* Olney also collected at Bear I. by W. R. Watson, July 5, 1922. *S. americanus* Pers. has been collected west of the Clay Belt at L. Nipigon by John Macoun, July 8, 1884 (distributed as *S. pungens* Vahl); southward on L. Superior at Batchawana reported by Taylor; and northward near James B. at Moose Factory collected by A. E. Porsild, No. 4630. It is therefore probable that *S. americanus* will also be found within the Clay Belt.

Scirpus validus Vahl

Tas. shore of Robertson L. (achenes ripe August 26, 1952), No. 4244; LAO. marshy river outlet, No. 5152.

Collected only twice in the Clay Belt and apparently rare. Certainly much less frequent than the common bulrush of the region, *S. acutus*, for which it may have been mistaken in some offshore colonies. Our material is the American var. *creber* Fern.

Scirpus acutus Muhl.

VM. marsh at end of L. Laperrière, No. 4524; LaS. floating margin of cat-tail marsh (in late anthesis July 17, 1954), No. 5885; Dup. shore of silted bay (achenes fullgrown August 23, 1952), No. 4236; Gog. growing 8 feet high on flooded shoal, No. 6005; Ger. mouth of narrow marshy bay, No. 6140.

The commonest bulrush throughout the Clay Belt. Forming characteristic colonies on sandy bottoms in shallow water and occurring in marshes and on wet shores.

Scirpus rubrotinctus Fern.

Math. marshy shore of small lake, No. 3199; Kap. wet clay creek-bank (in anthesis July 4, 1953), No. 5003.

These specimens differ markedly in size of stem and in compactness of glomerules. No. 5003 is stout with broad leaves and dense glomerules; and No. 3199 is slender with narrow leaves and loose glomerules. However, they do not seem to fit the descriptions in Gray's Man. of the extreme forma *confertus* (Fern.) Weath. and forma *radiosus* Fern.

Collected only twice but noted in the field as occasional along shores of streams and lakes and in marshy places.

Scirpus atrovirens Willd.

LTO. shore of muddy creek, No. 5330; Coch. marshy shore of back-water, No. 4622.

This material has the pale green and strongly nodulose-septate leaves of the typical variety.

Dup. marshy lake shore (ripe achenes dropping August 22, 1952), No. 4196.

The inflorescences of this specimen have strongly ascending longer rays, and the leaves are not superficially nodulose-septate, placing it with var. *georgianus* (Harper) Fern.

This species is rare in the Clay Belt on marshy shores. It is listed by Hustich (1955) northward at Renison on the Moose R.

Scirpus cyperinus (L.) Kunth

This is treated as a single polymorphic species in the New B. & B. including *S. pedicellatus* Fern. and *S. atrocinctus* Fern. That seems the best way to treat the Clay Belt material, which was sorted as follows:

VdO. ditch at railway station (in late anthesis July 10, 1952), No. 3085; LAO. sandbar at Chesney Bay, No. 5145; Kap. highway ditch through black spruce woods, No. 3430, and around pools at falls, No. 3345.

These have dark involucels and spikelets and generally match the typical *S. atrocinctus* Fern.

NL. roadside through willow thickets, No. 5249; Amos, sandy roadside through young poplar woods, No. 5400; Coch. shore of small sandy lake, No. 3873.

The inflorescences of these specimens have subglobose heads as in *S. atrocinctus* forma *brachypodus* (Fern.) S. F. Blake or *S. cyperinus* var. *pelius* Fern. forma *condensatus* (Fern.) S. F. Blake in the treatment of Gray's Man.

NL. roadside through willow-thickets, No. 5248; LAO. marshy river shore, No. 5093; IF. clay lake shore (in anthesis July 9, 1953), No. 5041; Coch. shore of small sandy lake, No. 3872; Kap. highway ditch through black spruce forest, No. 3431.

The above series of coarser plants have lateral spikelets pedicelled, drab involucels and spikelets, and seem to belong with *S. pedicellatus* Fern. var. *pullus* Fern.

The varieties and forms of the polymorphic *S. cyperinus* were frequently found growing together in the Clay Belt. These wool-grasses occur commonly throughout our area on shores and in marshes, ditches, and wet clearings in the forest.

Eriophorum opacum (Bjornstr.) Fern.

Tas. trail through wet black spruce – jack pine forest (in anthesis June 11, 1954), No. 5710; Kap. winter road through old black spruce forest (achenes ripe June 30, 1953), No. 4971.

Rare. Found only at two widely separated places in the Clay Belt on trails in the forest.

Eriophorum spissum Fern.

NL. *Chamaedaphne-Andromeda-Ledum* bog (in anthesis May 29, 1954), No. 5606; Amos, drained bog, No. 2985; LL. *Chamaedaphne-Ledum* bog (achenes mature June 22, 1952), No. 2810; Tim. open sphagnum bog, No. 4764.

Frequent throughout our region in open sphagnum bogs and in low boggy thickets.

Eriophorum gracile W. D. J. Koch

Coch. floating bog around lake (past maturity August 13, 1952), No. 3974.

This small collection has weak culms, the blunt blades of the uppermost culm-leaves shorter than their sheaths, and it has no young basal leaves. It seems safe to call it *E. gracile* and not the similar *E. tenellum*, although the inflorescences are too old for good bract and scale characters.

Recognized only once, it is aparently rare, although it may have been passed unnoticed, because it is inconspicuous except when the inflorescence is well expanded.

Eriophorum tenellum Nutt.

Tim. sedge meadow around bog (mature August 17, 1952), No. 4073.

This collection has somewhat scabrous culms, the sharp-pointed blades of the uppermost culm-leaves longer than their sheaths, and a few young basal leaves. The rounded brown scales are also characteristic of this species and not the similar *E. gracile*.

Seen only once in our area, it is evidently rare. Not reported north of our region.

Eriophorum angustifolium Honckeny

NL. in sphagnum, pool in willow thickets (past anthesis June 13, 1952), No. 2550; OttR. open sphagnum bog, No. 5825; VdO. floating bog around small lake, No. 5524; LL. *Chamaedaphne-Ledum* bog, No. 2811.

Occasional throughout the Clay Belt on floating bogs and in open boggy places generally.

Eriophorum viridi-carinatum (Engelm.) Fern.

Coch. wet trail through old black spruce forest, No. 3915; Kap. winter road through old black spruce forest (achenes mature June 30, 1953), No. 4972; Long. lakeshore meadow, No. 3625.

Occasional in wet meadows and wet openings in black spruce forest

Kap. sedge marsh around small lake, No. 4929.

This specimen has the crowded spikelets in a dense glomerule as in forma *Fellowsii* Fern.

Eriophorum virginicum L.

VdO. *Chamaedaphne* bog (in anthesis July 8, 1952), No. 3049; Dup. boggy roadside ditch through black spruce forest, No. 4233; Math. floating bog, No. 3227; Tim. boggy shore of small lake, No. 4013.

Occasional on floating bogs and shores, in boggy thickets, extending into ditches in black spruce forest. Not reported northward.

Sen. boggy ditch through black spruce forest, No. 4360; Tas. small boggy lake, No. 4290.

These specimens have the white bristles of forma *album* (Gray) Wieg., which occurs less frequently than the typical form and in the same habitats.

Rhyncospora alba (L.) Vahl

Tas. floating bog (achenes ripe and dropping August 29, 1952), No. 4286, and open sphagnum bog, No. 5441; Math. floating bog (in anthesis July 16, 1952), No. 3220; Tim. boggy shore of small lake, No. 4003.

This material has the retrorsely barbed bristles of the typical form.

Occasional, locally abundant on floating bogs. Not reported north of our region.

Rhyncospora fusca (L.) Ait. f. has been collected at several stations on the north shore of L. Superior, the nearest to the Clay Belt being Schreiber, by Hosie, Lost & Bannan, No. 713. This species probably will be found at the southern margin of the Clay Belt.

Cladium mariscoides (Muhl.) Torr. has been collected close to our region in the Temagami Forest Reserve by W. R. Watson, August 19, 1922. It is probable that the range of this species extends into the L. Timiskaming portion of the Clay Belt.

Carex gynocrates Wormsk.

LaS. bog, black spruce forest, No. 4564; Coch. wet trail in old black spruce forest (fruits mature and dropping August 11, 1952), No. 3922; Tim. old black spruce forest, No. 4837; Kap. winter road through old black spruce forest, Nos. 4967 and 4973.

Occasional in the Clay Belt in bogs and boggy openings in the black spruce forest.

Carex chordorrhiza L. f.

NL. *Chamaedaphne-Andromeda-Ledum* bog (in anthesis May 29, 1954), No. 5603; Tim. boggy shore of small lake (fruit ripe and mostly dropped August 15, 1952), No. 4655; Hst. open bog, No. 3826; Long. flooded ground between pond and lake, No. 3568.

Occasional but locally abundant in open bogs and on very wet boggy shores.

Carex foenea Willd.

C. siccata New B. & B.

Math. sandy bank above bog (past anthesis July 16, 1952), No. 3228.

Seen only once in our region and not reported northward.

Carex vulpinoidea Michx.

VdO. clearing on river-bank, No. 3073; Coch. alder thicket, No. 5190, and shore of small sandy lake (fruit mature August 10, 1952), No. 3864; Math. damp river shore, No. 3264.

Occasional on wet meadows, shores, and thickets. Not reported north of our region.

Carex diandra Schrank

LaS. floating margin of cat-tail marsh, No. 5879; LAO. sandbar at creek outlet, willow thickets (mature dropping July 14, 1953), No. 5108; Math. sedge meadow on silt, No. 3134; Kap. winter road through old black spruce forest (in anthesis June 30, 1953), No. 4957; Hst. open bog, No. 3835.

Occasional in a variety of wet habitats from bogs to shores in wet clearings in the forest.

Carex prairea Dew.

NL. road through peat bog, Nos. 2657 and 2658; Math. below spring, silted shore of small lake (fruit mature July 13, 1952), No. 3112; Tim. open, floating sedge marsh (in anthesis June 15, 1953), No. 4793; Kap. sedge marsh around small lake, No. 4935.

Occasional on boggy, marshy, and silted shores. Reported northward by DLD as locally abundant and probable at its northeastern limit up to Attawapiskat on James B.

Carex stipata Muhl.

LTQ. wet crevices on rocky lake shore (past anthesis June 8, 1953), No. 4733; VdO. drainage ditch, No. 3057; LAO. sandbar (ripe fruit dropping July 15, 1953), No. 5146; Tim. grassy creek-bank, No. 4839.

Frequent on wet shores throughout the Clay Belt and in wet clearings and ditches.

Carex disperma Dew.

NL. trail through jack pine forest (fruit mature June 14, 1952), No. 2616; WasR. wet aspen poplar–birch woods, lake shore, No. 5790; Tas. open black spruce bog, in sphagnum, No. 5705; Tim. drainage ditch in black spruce forest, No. 4811; Kap. alder thicket around beaver pond, Nos. 4901 and 4902.

Common throughout the Clay Belt in a wide variety of wet habitats in forests, bogs, and shores. A characteristic sedge of the typical wet black spruce forest of our region. Spreading into wet clearings.

Carex trisperma Dew.

NL. trail through jack pine forest, No. 2617; LMat. wet place in black spruce-birch forest, No. 5809; Kap. mossy floor of old black spruce forest (in anthesis June 30, 1953), No. 4961.

These collections and all plants observed in the Clay Belt were of the typical variety. The var. *Billingsii* Knight with setaceous leaves evidently does not extend as far northwest as our region.

Frequent throughout our region and locally abundant in wet, old, black spruce forest.

Carex tenuiflora Wahlenb.

NL. black spruce-larch bog, No. 2562; LaS. wet sedge meadow beside highway, No. 2820, and bog, black spruce woods, No. 2888; Kap. winter road through old black spruce forest (perigynia fullgrown June 30, 1953), No. 4958.

Occasional in bogs and boggy woods throughout our area and occurring also in wet clearings.

Carex loliacea L.

Kap. winter road through black spruce forest (perigynia fullgrown June 30, 1953), No. 4963.

Collected only once and apparently rare, although it may have been overlooked in the field in mistake for the common *C. disperma* which it resembles.

This northern Cordilleran species has been reported from Nueltin L., Manitoba (Baldwin, 1953) and from the Albany R., Ontario, by DLD. Our collection from Shanly Twp. (lat. 49° 08′ N.) near Kapuskasing, Ontario, was made on the northern boundary of the range of Gray's Man., which does not list this species. Our record is the easternmost report of *C. loliacea*.

Carex canescens L.

NL. small pool with sphagnum, open willow thicket, No. 2551; LaS. wet sedge meadow beside highway, No. 2824; Tim. sandy river shore (in anthesis June 21, 1953), No. 4841; Kap. winter trail through old black spruce forest (perigynia fullgrown June 30, 1953), No. 4964.

These and all other collections and observations of this species in the Clay Belt have heads with approximate spikes having the dimensions of the typical variety.

Common in wet sedge meadows, bogs, shores, and wet openings in the forest throughout the Clay Belt. Spreading into ditches and very wet clearings.

Carex brunnescens (Pers.) Poir.

NL. young birch-poplar woods on limestone (past anthesis June 11, 1952), No. 2482; Amos, trail through white spruce woods, No. 2939; Arnt. sandy river shore, No. 2771; Kap. winter road through old black spruce forest, No. 4965.

These specimens have rather stiff straight culms, with lowest spikes less than one centimetre apart, placing them with the typical variety in the treatment of Gray's Man.

NL. clay-banked ravine, poplar-spruce woods, No. 2697; LWas. grassy clearing in aspen poplar – black spruce forest, old camp-site, No. 5778; Arnt. drained black spruce bog, No. 2762; Tim. trail through old aspen poplar woods, No. 4846; Kap. river-bank (ripe fruits dropping July 20, 1952), No. 3364.

The above series and all other collections have the arching culms with lowest spikes more than 1 cm. apart, of the var. *sphaerostachya* (Tuckerm.) Kukenth. as treated in Gray's Man. Most of the Clay Belt material belongs to this variety.

A common species throughout the Clay Belt in wet woods and spreading abundantly into ditches and wet clearings.

Carex arcta Boott

LWas. grassy clearing in aspen poplar – black spruce forest, old camp-site (in anthesis June 29, 1954), No. 5779, and grassy field, No. 5729; Amos, river shore (perigynia fullgrown July 3, 1952), No. 2973; Arnt. sandy river shore, No. 2764.

Occurs occasionally on shores and grassy clearings and collected only in the Quebec portion of the Clay Belt. In Ontario this species has been collected west of our area at Long Portage, Nipigon R., John Macoun, July 2, 1884.

Carex Deweyana Schwein.

VM. balsam fir – aspen poplar woods, No. 4727; LTO. lakeshore cedar woods, No. 5215; Tim. wet lake shore, aspen poplar woods, No. 4775; Kap. lakeshore alder thicket (in anthesis June 24, 1953), No. 4873, and river-bank (fruit mature July 20, 1952), No. 3306.

Frequent throughout our area in shore thickets, and in mixed coniferous and deciduous woods where, in low land, it forms a characteristic ground-cover conspicuous in the late spring aspect.

LWas. trail through black spruce forest (perigynia immature June 26, 1954), No. 5736.

This material has contiguous spikes, the lowest close, matching specimens of var. *collectanea* Fern. from Gaspé, Quebec.

Found only once at the northeastern end of our region on a trail through black spruce forest. This collection represents a large westerly extension of range for this variety from the Gaspé Peninsula area given in Gray's Man.

Carex exilis Dew. has been collected on L. Superior as close to the Clay Belt as Schreiber by Hosie, Losee & Bannan, No. 892; and eastward at L. Mistassini by Rousseau & Rouleau, No. 290. It would therefore be expected within our area although we did not find it.

Carex interior Bailey

NL. ditch beside road through drained bog, No. 4546; Amos, sandy lake shore (perigynia fullgrown July 1, 1952), No. 2906; LaS. wet sedge meadow beside highway, No. 2823.

These specimens all have the beak of the perigynium minutely notched separating them from the other species of the difficult section *Stellulatae*. In the field, however, these similar species were not distinguished, and therefore there are no separate notes on frequency. The specimens cited above come from three widely separated points in the Clay Belt.

The northern extent of the range of *Carex sterilis* Willd. is given in Gray's Man as Newfoundland to southern Ontario and Minnesota. In ed. 8, parts of *C. sterilis* of ed. 7 are to be found under *C. atlantica* Bailey of the Atlantic coast, and under *C. Wiegandii* Mackenz. also ranging from Newfoundland to Ontario and southward. In the New B. & B. *C. sterilis* is not maintained, but it is mentioned under *C. incomperta* Bickn. ranging from Quebec southward, under *C. atlantica,* and under *C. muricata* L. var. *sterilis* (Carey) Gl. with a range from Newfoundland to Minnesota and southward.

Material that belongs to *C. Wiegandii* has been collected in the Clay Belt (*see* below), but there are no collections which belong to *C. sterilis* in the treatment of Gray's Man., although the similar *C. echinata* Murr. occurs (*see* below). *C. sterilis* has been reported north of our region, however, at Albany by DLD, who remarked: "Ceci représente une extension d'aire vers le nord." It has also been reported by Taylor on L. Superior at Batchawana and collected farther west in Sibley Twp. by Taylor, Losee & Bannan, No. 1423.

C. sterilis should remain, therefore, on the list of species possibly occurring in the Clay Belt.

Carex echinata Murr.

Kap. sedge marsh around small lake, No. 4931, and grass meadow around same lake, No. 4941.

This material habitally resembles *C. interior* but differs in having beaks of perigynia sharply bidentate. The pale, blunt scales, with midribs evanescent below the hyaline tip, are about half the length of the perigynia placing it with *C. echinata* in the treatment of Gray's Man. Not reported northward or westward.

Carex Wiegandii Mackenz.

Amos, drained bog, No. 2984.

This specimen has scales with hyaline tips as in *C. echinata* but differs in having coarse culms, broader leaves, and thick-beaked perigynia, placing it with *C. Wiegandii* in the treatment of Gray's Man. Not reported northward.

Carex cephalantha (Bailey) Bickn.

C. muricata var. *cephalantha*, New B. & B.

OttR. gravelly river shore, No. 5867; LaS. floating margin of cat-tail marsh (fruits mature July 17, 1954), No. 5881.

These collections differ from the two preceding species in having the midribs of the scales prominent to the tip. In No. 5867 the heads of the culms are 4 cm. long with mostly 5 remote spikes, and in No. 5881 spikes are approximate and the heads only 2 cm. long. Both specimens have broad perigynia sharply nerved on the inner face. Following the treatment in Gray's Man. they are referred to this species. This species was collected north of the Clay Belt on the Harricanaw R. by Dutilly & Lepage, No. 15,265 (revised from *C. interior* by H. J. Scoggan).

Carex angustior Mackenz.

C. muricata var. *angustata*, New B. & B.

VdO. floating bog, No. 3076.

This specimen habitally resembles the collections of the preceding species (particularly No. 5881) but differs in having narrower perigynia, nerveless on the upper face and ligules of the leaf-sheaths as broad as long. Revised from *C. cephalantha* by H. J. Scoggan.

Although collected but once in the Clay Belt, this species has been reported frequently both north (Potter, 1934, and Hustich, 1955) and south (Taylor) of our region.

Carex scoparia Schkuhr

VdO. ditch at railway station, No. 4578; Math. creek outlet on Black R., No. 3279.

Not certainly distinguished in the field from other similar species in the large section *Ovales*, and therefore reliable notes on the frequency and habitat of this species are lacking. These specimens, collected at two widely separated points on July 10 and 18, 1952, were not fully mature.

This species was reported north of our region at Moosonee by DLD, who remark that this is the only James B. record known to them. It was also collected at Smoky Falls just outside the Clay Belt, north of Kapuskasing, by Hustich, No. 1193.

Carex tribuloides Wahlenb.

Math. roadside at creek (spikelets fullgrown, July 13, 1952), No. 3181, and river shore, No. 3192; Coch. aspen woods below high bank, No. 5188.

In the field this species may have been overlooked in mistake for the similar and common *C. projecta*, and reliable field notes on frequency and

In the field confused with immature and depauperate plants of other similar species. Notes on frequency and habitat lacking. Not reported northward.

Carex adusta Boott

NL. road through jack pine forest, No. 2606; VdO. sandy jack pine woods, No. 3051; Amos, on sand in jack pine forest, No. 2915; Arnt. crevices on rock face, No. 2742; LaS. sandy jack pine woods (mature July 17, 1954), No. 5903; LAO. 2-year-old burn of black spruce–jack pine forest, sand gravel ridge, No. 5105; Math. road through jack pine forest No. 3188; Gog. roadside through black spruce forest, No. 6038.

Frequent throughout the Clay Belt in sandy jack pine forest, spreading abundantly into openings and clearings, occurring also in exposed rock crevices. This species is not listed by Soper (1949) for southern Ontario, nor does it occur north of the Clay Belt. East and west of our region it is relatively much less frequent. It is therefore a typical and characteristic plant of the dry portions of our region.

Carex aenea Fern.

LTQ. rocky crevices on open lake shore, No. 4693; OttR. trail through cut black spruce forest (fruit mature July 13, 1954), No. 5854; LaS. sandy waste land around town dump, No. 5905; Tim. sandy clearing in jack pine forest, No. 4803; Kap. open rocky ledges around lake, No. 4890.

Frequent throughout our area in open woods, rocky shores, and spreading into dry clearings. Extending north of our region to James B. where it was collected at Charlton I., by A. E. Porsild, No. 4342.

Carex praticola Rydb.

NL. sandy trail through grazed woods, No. 2650; LWas. grassy field near settlement (perigynia nearly fullgrown, June 26, 1954), No. 5733.

Collected at two widely distant points in dry clearings. Apparently rare in our region although it may have been overlooked in mistake for *C. aenea* and other similar and commoner species in the large section *Ovales*.

Carex argyrantha Tuckerm. has been collected close to the southern margin of the Clay Belt in the Temagami Forest Reserve by W. R. Watson, June 26, 1922. This species probably does occur within our region, most likely in the L. Timiskaming portion.

Carex sychnocephala Carey

Coch. shore of small sandy lake, No. 3863; Tim. clearing on lake shore (fruit mature August 16, 1952), No. 4029; Kap. sandy shore of pond, No. 3472.

Scarce, on sandy shores of small lakes and clearings. Not reported north of our region.

Carex leptalea Wahlenb.

NL. black spruce-larch bog, No. 2563; LMat. creekside in black spruce forest, No. 5799; LaS. wet sedge meadow beside highway, No. 2822; Tim.

drainage ditch in black spruce forest (in late anthesis June 17, 1953), No. 4814; Gog. rivershore sedge marsh (fruit mature and dropping July 26, 1954), No. 6035.

Frequent throughout our region in boggy and marshy places and in ditches and wet openings in the black spruce forest.

Carex Backii Boott

LL. roadside through granite outcrop (perigynia fullgrown June 19, 1952), No. 2734; Math. sandy jack pine woods, No. 3186.

Found only twice in dry sites and evidently rare in the Clay Belt. Not reported northward.

Our region lies within the range of *Carex scirpoidea* Michx., and we therefore looked carefully for it in exposed habitats in the limestone region around L. Timiskaming and on the hills of the northern portion of the Clay Belt. The nearest record to the Clay Belt is the collection from Mortimer I., near Schreiber on L. Superior, by Hosie, Losee & Bannan, No. 893. This species probably will be found within our area.

Carex pensylvanica Lam. has been reported at Batchawana on L. Superior by Taylor. This species may possibly occur within the southern margin of our region

Carex communis Bailey

VM. roadside through aspen poplar – balsam fir woods, No. 4728; LTQ. rocky crevices on open lake shore (past anthesis June 6, 1953), No. 4694; NL. sandy loam in jack pine forest, No. 2605.

Found only in the L. Timiskaming portion of the Clay Belt and there evidently reaching the northern limit of its range.

Carex Peckii Howe

C. nigro-marginata var. *elliptica,* New B. & B.

Hail. hazel thickets on river-bank (past anthesis May 30, 1954), No. 5625; VM. sandy roadside through aspen poplar – balsam fir woods, No. 4729; Tim. wet lake shore, aspen woods (perigynia fully developed June 13, 1953), No. 4776.

Common in mixed coniferous-deciduous woods of the Little Clay Belt where it is a conspicuous element in the spring aspect. Less frequent elsewhere in our area. Collected at Cochrane and Kapuskasing by M. O. Malte, June 22 and 23, 1918; and northward near James B. at Moose Factory by A. E. Porsild, No. 4622.

Two collections from L. Superior have been revised to *Carex Emmonsii* Dew. by H. J. Scoggan. They were collected in Sibley Twp. by Taylor, Losee & Bannan, No. 1392 (distributed as *C. pennsylvanica*), and at Michipicoten by Hosie, Harrison & Hughes, No. 901 (distributed as *C. varia*). It is possible that this species will be found in the Clay Belt.

Carex deflexa Hornem.

NL. young birch-poplar woods on limestone, No. 2480; LWas. burned black spruce forest, No. 5743; Amos, white spruce woods, No. 4570; LL. roadside clearing (fruit mature and dropping June 19, 1952), No. 2725; Math. spruce-birch forest on rocky hillside, No. 4823.

A common and characteristic plant of the drier sites throughout the Clay Belt, particularly along trails, after forest fires, and in dry clearings.

Carex umbellata Schkuhr

C. rugosperma sensu Mackenz.

NL. sandy jack pine woods (fruit mature June 15, 1952), No. 2633.

This single, but large, collection has the relatively soft long leaves and pubescent perigynia that distinguish this species from *C. tonsa,* and long acuminate tips to the pistillate scales that separate it from *C. abdita* in the treatment of Gray's Man. The plants have short culms as well as long (up to 11 cm.) stiffly ascending ones, placing them with forma *vicina* (Dew.) Wieg.

Found but once in the L. Timiskaming portion of the Clay Belt, which is probably the northern limit of the range of this species.

Carex abdita Bickn.

C. umbellata sensu Mackenz. and under that species in the New B. & B.

LTQ. rocky crevices on open lake shore (some perigynia apparently fullgrown June 6, 1952), No. 4696.

This is another large single collection which has been separated with some misgivings from the similar *C. umbellata* on the basis of the more globose perigynia with shorter beaks, and the pistillate scales with short acute tips, following the treatment of Gray's Man.

Like *C. umbellata* it is rare. We found it only on the rocky shore of L. Timiskaming. Dutilly and Lepage (1952) report this species on the Harricanaw R., which flows through Amos northward to James B.

Carex tonsa (Fern.) Bickn.

Under *C. umbellata* in the New B. & B.

NL. sandy loam in jack pine forest, No. 2601; Amos, jack pine forest, on sand, No. 2899; IF. railway through young jack pine forest on sand, No. 5031; Tim. sandy clearing in jack pine forest (perigynia fullgrown June 17, 1953), No. 4804; Gog. sandy meadows above lake shore, No. 5998.

All this material differs from our collections of *C. umbellata* and *C. abdita* in having stiffly spreading leaves and glabrous perigynia.

A common and characteristic plant of the sandy jack pine forest of the Clay Belt. There is a collection of stunted plants of this species from Nemiskau L., a few miles beyond the northeastern margin of our region, by Dutilly & Lepage, No. 5322 (distributed as *C. rugosperma,* revised by H. J. Scoggan).

Carex pedunculata Muhl.

NL. damp poplar woods on limestone ridge, No. 2472; LTQ. aspen poplar–birch woods, hillside (past anthesis June 6, 1953), No. 4701.

Occasional in deciduous woods in the L. Temiskaming portion and collected in the northern Clay Belt at Cochrane by M. O. Malte, June 22, 1918.

Carex Richardsonii R.Br.

Kap. rocky river-bank (fruit mostly dropped off July 20, 1952), No. 3322.

This small, overmature collection is our only record of this species definitely within the Clay Belt. It has been collected north of Amos, on the Harricanaw R., lat. 48° 20′ to 51° N. (which straddles the northern margin of our area), Dutilly & Lepage, No. 15,188.

Carex concinna R.Br.

Kap. sandy river shore, cedar woods, No. 4951; Hst. young poplar-spruce woods on bank of Missinaibi R. (past anthesis June 5, 1954), No. 5653.

Rare, found only twice on wooded river-banks.

Carex eburnea Boott

LTO. limestone talus slope, young birch – aspen poplar woods (in anthesis May 27, 1954), No. 5561, and open shingle beach (fruit ripe and dropping off July 21, 1953), No. 5229; Kap. sandy river shore, cedar woods, No. 4950.

Occasional on open slopes and shores of limestone region of the Little Clay Belt and rare elsewhere in our area.

Carex Garberi Fern.

Long. silted shore of Phipps L. (fruit mature and dropping July 30, 1952), No. 3631.

This small collection has the long, soft culms, with lowest spikes well separated, which distinguish var. *bifaria* Fern. from the typical variety.

Rare, found only once at the western end of our region.

Carex aurea Nutt.

NL. clay-banked ravine, poplar-spruce woods (in late anthesis June 17, 1952), No. 2691; Kap. sedge marsh around small lake, No. 4928.

Occasional but locally abundant in sedge meadows and wet clay-banks.

Carex crinita Lam.

VdO. lake shore, thickets, and clearing (perigynia fullgrown July 8, 1952), No. 3032; Amos, river shore, No. 2981.

These collections have the smooth leaf-sheaths and loosely spreading pistillate spikes of the typical variety.

Scarce, on shores. Not reported northward.

Kap. spruce-poplar woods at Big Beaver Falls (fruit ripe July 26, 1952), No. 3533.

This collection has the rough-hispidulous leaf-sheaths and drooping pistillate spikes of var. *gynandra* (Schwein.) Schwein. and Torr.

The variety was collected only once.

This species and its variety are scarce in the Clay Belt and probably at the northern limit of their range.

and habitat preference. However, the wide-spreading and very sharp scales with minutely beaked perigynia, with spikes rarely staminate at tip or attenuate at base, and culms much overtopping the leaves, are distinctive. Collected at widely separated points throughout the Clay Belt. Reported northward by Dutilly and Lepage (1952).

Two more species of *Carex* have been collected north and south of the Clay Belt and may be expected within our region, although we did not find them. The nearest records to our area were collected on L. Superior near Schreiber by Hosie, Losee & Bannan. These are: *Carex media* R.Br., No. 991, revised by A. E. Porsild, distributed as *C. Oederi* var. *pumila;* and *C. atratiformis* Britt., No. 838, revised by A. E. Porsild, distributed as *C. paupercula* var. *irrigua.*

Carex Buxbaumii Wahlenb.

Math. sedge marsh on silt around Pike L., No. 3145; Kap. around pools, beside Big Beaver Falls (fruit ripe and dropping July 26, 1952), No. 4613.

Rare; collected only twice in the Clay Belt on shores at two widely separated points.

LTQ. rocky crevices on open lake shore (past anthesis June 6, 1953), No. 4692; silted shore of small lake, No. 4786.

The specimens of these large collections have more densely aggregate heads, very dark scales, and some purely staminate terminal spikes which at first suggest *C. Morrisseyi* Porsild (Sarg. 4, p. 21, 1943). They differ, however, in having long-awned scales and frequently androgynous and gynecandrous terminal spikes. With these variations these plants do not seem to belong to any of the forms given in Gray's Man.

Carex limosa L.

Amos, in sphagnum, floating bog, No. 2913; Tas. boggy shore of small lake (fruit mature August 7, 1953), No. 5444; LaS. floating margin of cat-tail marsh, No. 5876; Tim. open floating sedge marsh, No. 4792.

Frequent in floating bogs and marshes.

Carex paupercula Michx.

NL. open labrador tea bog, No. 2565; OttR. open sphagnum bog (fruit mature and dropping July 11, 1954), No. 5849; Kap. winter road through old black spruce forest, No. 4969.

Occasional in bogs and boggy openings and clearings.

Carex scabrata Schwein. has been reported at Batchawana on L. Superior by Taylor. The range of this species may possibly extend to the southern margin of the Clay Belt.

Carex Houghtonii Torr.

NL. sandy loam in jack pine forest, No. 2611; VM. gravelly roadside through poplar woods (fruit ripe July 22, 1954), No. 5977; LWas. gravelly hillock, No. 5730; Amos, trail through white spruce woods, No. 4567; Tim. sandy jack pine – aspen poplar woods (in anthesis June 13, 1953), No. 4773.

Common on dry sites throughout the Clay Belt. A characteristic plant of the sandy jack pine forest, it has spread abundantly into dry clearings and along gravelly roadsides.

Carex lasiocarpa Ehrh.

Amos, silted clay shore (fruit mature August 5, 1953), No. 5405; LaS. open sphagnum bog, No. 5900; LAO. sandy beach at creek outlet, No. 5132; Math. sedge meadow on silt, No. 3133; Kap. main constituent of sedge marsh around small lake, No. 4934.

Common in a wide variety of marshy and wet places, locally abundant in boggy sedge marshes. Our material is the North American var. *americana* Fern.

Carex lanuginosa Michx.

C. lasiocarpa var. *latifolia*, New B. & B.

LaS. wet sedge meadow beside highway (perigynia immature June 27, 1952), No. 2821.

Differing from *C. lasiocarpa* var. *americana* in its flat scabrous leaves and acutely-angled scabrous culm, this collection belongs to *C. lanuginosa*.

Collected only once and apparently rare, although it may have been overlooked in mistake for the similar and common *C. lasiocarpa*.

Carex pallescens L.

Amos, trail through white spruce woods (perigynia fully developed July 2, 1952), No. 2933.

Rare, collected only once in the northern Quebec portion of the Clay Belt. Not reported northward. Our material is the eastern North American var. *neogaea* Fern.

Carex gracillima Schwein.

NL. elm-ash woods on hillside (fruit mature and dropping July 21, 1953), No. 5208; Tim. sandy river shore, No. 4843.

Rare, found at two widely separated points and also reported on the northern margin of the Clay Belt on the Harricanaw R. at lat. 49° 50′ N. by Dutilly and Lepage (1952).

Carex castanea Wahlenb.

Amos, trail through white spruce forest (fruit ripe July 2, 1952), No. 2934; LaS. sedge meadow beside highway, No. 2819; Tim. gravelly clearing in black spruce forest (in late anthesis June 17, 1953), No. 4810; Kap. grassy clearing with *Sisyrinchium*, No. 4923.

Occasional in openings in the forest, meadows, and clearings throughout the Clay Belt.

Carex arctata Boott

LTQ. aspen poplar – birch woods, hillside (perigynia fullgrown June 6, 1953), No. 4702; NL. damp poplar woods on limestone ridge, No. 2473; Amos, clearing in white spruce woods (fruit mature and dropping July 3, 1952), No. 2955; Tas. lakeshore clearing in jack pine forest, No. 5720; Tim. gravel pit in black spruce forest, No. 4808.

Frequent in a wide amplitude of woodland habitats and in clearings.

Carex debilis Michx.

OttR. ashwoods on low lake shore, No. 5836, and trail through black spruce forest, No. 5859; VdO. clearing on lake shore (fruits ripe and dropping July 8, 1952), No. 3046; Arnt. sandy river shore, No. 2767.

Occasional in damp woods and clearings near shores in the Quebec portion of the Clay Belt, not collected westward in Ontario. Our material is var. *Rudgei* Bailey.

Carex capillaris L.

Kap. around pools on river shore at Big Beaver Falls (fruits mostly dropped July 26, 1952), No. 3541.

This specimen has the long culms (up to 50 cm.) with widely separate spikes, and perigynia gradually narrowed to stout beaks, of var. *elongata* Olney (var. *major* in Gray's Man.).

Rare, found only once. Possibly it was more frequent in the limestone area of the Little Clay Belt before most of the forest was cut and burned at the time of settlement.

Carex granularis Muhl.

Kap. clearing in spruce-poplar forest (fruits ripe July 26, 1952), No. 3524.

This collection has the comparatively slender perigynia, less than 1.5 mm. thick of var. *Haleana* (Olney) Porter.

Rare, collected only once in a forest clearing. Reported northward in the James B. lowlands by DLD.

Carex Crawei Dew.

NL. railway ditch through poplar woods (in late anthesis June 15, 1952), No. 2646; LTO. open shingle beach, No. 5222.

Rare and found only in the limestone region of the Little Clay Belt. Reported northward in the Palæozoic basin of James B. by DLD.

Our region lies within the range of *Carex livida* (Wahlenb.) Willd. var. *Grayana* (Dew.) Fern. The nearest collection to the Clay Belt is from the Slate Is., near Schreiber on L. Superior, by Hosie, Losee & Bannan, No. 891. Although we did not find this species, it may be expected in bogs and particularly in the limestone regions of L. Timiskaming or L. Waswanapi.

Carex vaginata Tausch

NL. cedar woods around small lake (past anthesis June 15, 1952), No. 2654; Kap. sphagnum floor of black spruce forest, Nos. 4892 and 4907, and mossy floor of old black spruce forest, No. 4962.

Occasional on boggy and mossy floors of old black spruce forests and cedar woods.

Carex laxiflora Lam. sensu Gleason

VM. trail through white spruce-aspen poplar forest (past anthesis June 8, 1953), No. 4724; NL. open wet area in jack pine woods, No. 2602; VdO. birch woods on sandy shore, No. 3026; Math. shore of small lake

(fruit ripe and dropping July 16, 1952), No. 3231; Tim. aspen poplar-spruce woods, No. 4849.

The above specimens are easily distinguished from the common *C. leptonervia* by the conspicuous nerves on the perigynia. But the difficulties of deciding between several other similar species in the section *Laxiflorae* proved too great. They have therefore been referred to *C. laxiflora* following the treatment of the New B. and B., in which a number of species segregated in Gray's Man. are brought together as varieties of that species.

The small amount of material from the Clay Belt and these taxonomic difficulties make it impossible to give a clear idea of frequency or habitat preference of this highly variable species which probably reaches its northern limit in the Clay Belt.

Carex leptonervia Fern.

LTO. old elm woods (in anthesis May 28, 1954), No. 5583; LMat. wet birch–black spruce forest, No. 5803; Amos, trail through white spruce woods (fruit ripe July 2, 1952), No. 2925; Tim. grassy creek-bank, No. 4840; Kap. margin of black spruce forest–alder thicket, No. 4904.

Common in the L. Timiskaming portion, frequent and locally abundant throughout the Clay Belt in wet deciduous woods and thickets, and in wet grassy clearings.

Carex flava L.

Amos, meadow above silted lake shore, No. 5415; Math. sedge marsh on silt, No. 3118; Tim. sedge meadow around bogs (perigynia fullgrown August 17, 1952), Nos. 4069 and 4071; Kap. wet rocky shore at falls, No. 3551.

The above series have the conspicuous brown pistillate scales and yellowish perigynia with the larger dimensions of the typical variety.

Common and locally abundant in sedge meadows around small lakes and bogs.

VM. silted lake shore, No. 5970; Tas. silted shore of quiet bay, No. 5438; Kap. boggy clearing beside stream, No. 3413; Hst. wet clearing at old lumber camp, No. 4619.

These specimens have the pale pistillate scales and greenish perigynia with the smaller dimensions of var. *fertilis* Peck (*C. cryptolepis* Mackenz.)

Occurring in similar habitats, sometimes with the typical variety and not so frequent. The range of *C. flava* extends north beyond the Clay Belt. The var. *fertilis*, however, has not been reported north of our region.

Carex lepidocarpa Tausch

C. flava var. *lepidocarpa*, New B. and B.

Gog. silted shore of small lake (not fully mature July 26, 1954), No. 6029.

In this collection the staminate spikes are long-pedunculed (up to 2 cm.), the pistillate spikes are remote, distinguishing it markedly from *C. flava*.

Seen only once near the southwestern boundary of the Clay Belt. This collection represents a considerable westward extension of the range of this species.

Carex viridula Michx.

NL. open alluvial shore, No. 5292; Math. sedge meadow on silt, No. 3125; Tim. sedge around bog (fruit ripe and dropping August 17, 1952), No. 4074; Long. silted shore, No. 3619.

Occasional, locally plentiful on silted shores and wet sedge meadows.

Carex pauciflora Lightf.

OttR. open black spruce bog, No. 5822; Amos, *Ledum* bog, No. 2898; Tas. open sphagnum bog, No. 5442; Math. bog (fruit ripe and dropping July 16, 1952), No. 3221.

Occurring only in open sphagnum bogs, throughout the Clay Belt.

Carex lacustris Willd.

Coch. marshy shore of backwater around Lillabelle L. (fruit mature and dropping August 10, 1952), No. 3900.

Rare and found only once in the richest aquatic habitat. Not reported northward.

Carex atherodes Spreng.

Math. marshy shore of small lake (perigynia fullgrown July 16, 1952), No. 3197.

Found only once in the Clay Belt.

Two species in the section *Pseudo-Cypereae* have been collected on the north shore of L. Superior. These are *Carex Pseudo-Cyperus* L. collected at Patterson I., near Schreiber, by Hosie, Losee & Bannan, No. 971, which possibly occurs in the nearby Clay Belt; and *C. comosa* Boott collected in Sibley Twp. by Taylor, Losee & Bannan, Nos. 1541 and 1556, which is unlikely to be found within our area.

Carex hystricina Muhl.

Coch. marshy shore of backwater (fruit ripe and dropping August 10, 1952), No. 3893; Math. sedge marsh, silted lake shore, No. 3143.

Rare, on marshy shores. Not reported northward.

Carex Michauxiana Boeckl

Tas. silted shore of quiet bay, No. 5437, and roadside, through open bog (fruit mature and mostly dropped August 31, 1952), No. 4335; Gog. silted shore of small lake, No. 6025.

Rare, found at two widely separated localities in the Clay Belt. There are many collections of this species from the north shore of L. Superior by Taylor, Hosie, *et al.*, but it is not listed in southern Ontario by Soper (1949) nor north of our area on the west side of James B. by DLD. The range given in Gray's Man. includes E. Asia.

Carex intumescens Rudge

NL. bottom of clay ravine, poplar-spruce woods (in late anthesis June 14, 1952), No. 2584; LWas. wet burned black spruce forest, No. 5744; VdO. lakeshore thickets, No. 3045; Tim. drainage ditch in black spruce

forest, No. 4813; Kap. thickets along river shore (fruit mature July 20, 1952), No. 3361.

This series and all other collections and observations have the thin (4 mm.) lanceolate or lance-ovoid perigynia of the northern var. *Fernaldii* Bailey.

Frequent in shore thickets and in wet openings. Not reported northward.

Carex retrorsa Schwein.

Amos, river shore, No. 2977; LAO. alder-willow thicket (in late anthesis June 28, 1952), No. 4559, and muddy shore of Lightning R., No. 5078, and sandy beach, No. 5127.

Occasional on shores and thickets and more frequent around Lake Abitibi. This species occurs as far northward as the Albany R., probably its northeastern limit, according to DLD.

Carex rostrata Stokes

NL. open alluvial shore, No. 5293; OttR. open sphagnum bog, No. 5829; LWas. grassy field (past anthesis June 26, 1954), No. 5727; LaS. marsh, No. 2835; LAO. sandbar at creek outlet, willow thickets, No. 5111; Gog. rivershore marsh of *Equisetum palustre*, No. 6014; Hst. marsh (fruit mature August 6, 1952), No. 3827.

The Clay Belt material shows considerable variation but does not warrant a separation into var. *utriculata* (Boott) Bailey and the typical variety as treated in Gray's Man.

Common throughout the Clay Belt in open wet habitats of shores, marshes, sedge meadows, and wet clearings.

Carex oligosperma Michx.

OttR. open black spruce bog, No. 5824; Amos, in sphagnum, floating bog (in late anthesis July 1, 1952), No. 2914; Tas. open sedge meadow in *Myrica* thickets, No. 5435; LL. *Chamaedaphne-Ledum* bog, No. 2809; boggy shore of small lake (fruit mature August 15, 1952), No. 4014.

Frequent in open boggy places throughout the Clay Belt and characteristic of floating sedge and sphagnum bogs.

Carex vesicaria L.

OttR. rocky shore around depot camp, No. 5846; LWas. grassy clearing in aspen poplar–black spruce forest, No. 5777; Dup. lake shore, silted bay (fruit mature August 20, 1952), No. 4121; Arnt. trail through alder-willow thicket, No. 2779; LAO. muddy river shore, No. 5077; Coch. margin of floating sedge bog, lake shore, No. 5183; Kap. winter road on Shanley Creek flood-plain (in late anthesis July 1, 1953), No. 4976.

After unsuccessful attempts to sort the large number of Clay Belt collections into the varieties of the treatment in Gray's Man., it was decided to leave all this very variable material under the specific name since the varietal distinctions seem too poorly marked and intergrading.

Common throughout our region where it occurs in a wide variety of habitats on shores and marshes and spreading vigorously into damp clearings.

52468-6—9

Carex saxatilis occurs north of our region. It has been collected close to the eastern end of the Clay Belt. The nearest collections to our area are: L. Chibougamau, Hustich, July 8, 1948, determined by A. E. Porsild as *C. miliaris* Michx. (*C. saxatilis* var. *miliaris*, Gray's Man.); and L. Mistassini, J. M. Macoun, July 6, 1885, determined by Fernald as *C. saxatilis* var. *rhomalea* Fern. It is possible that these will be found within the northern margin of the Clay Belt.

ARACEAE

Arisaema atrorubens (Ait.) Blume

A. triphyllum var. *triphyllum*, New B. & B.

LTQ. damp elm-ash woods (flowering June 12, 1952), No. 2532, and No. 5575.

Locally plentiful in damp deciduous woods in the Little Clay Belt where this species reaches its northern limit for this longitude.

Calla palustris L.

Amos, railway ditch through alder-willow thicket, No. 3013; Math. boggy lake shore, No. 3101; Tim. pools on boggy lake shore (in anthesis June 13, 1953), No. 4768.

Common in sheltered waters throughout our area, forming large colonies in shallow water off boggy shores and spreading into ditches.

Acorus Calamus L.

Amos, marshy creek shore at outlet to Harricanaw R., No. 5428: LaS. marshy river shore, No. 2890; Arnt. alder thickets on sandy lake shore. No. 2780; Kap. marshy shore of small lake (in anthesis July 24, 1952). No. 3451.

Occasional on marshy shores and thickets in our region. Evidently indigenous, as it is also reported to be north of our region, on the western side of James B. by DLD.

LEMNACEAE

Spirodela polyrhiza (L.) Schleid.

LTQ. marshy creek outlet, No. 4402; NL. cat-tail marsh, No. 5343; Tim. marshy widening of Frederick House R., No. 4022.

Occasional in the L. Timiskaming region, floating between stems of marsh plants. Less common northward in the Clay Belt and not reported north beyond our region.

Lemma trisulca L.

LKap. marshy backwater, one foot of water, No. 6085, and marshy creek outlet, No. 6045; Hst. marshy shoreline, No. 3816.

Occasional, suspended in shallow water of marshy creeks and sheltered bays.

Lemna minor L.

LTQ. marshy creek outlet, No. 4403; NL. cat-tail marsh, No. 5344; Coch. marshy shore of pothole lake, No. 3859, and ditch in marshy lake shore, No. 5082.

collection of the Spruce Falls Power and Paper Company by J. B. Millar and E. Bonner, No. 46.

Habenaria viridis (L.) R.Br.

LL. wet ashwoods (in flower June 19, 1952), No. 2736.

This specimen has the long, narrow, and widely divergent bracts of var. *bracteata* (Muhl.) Gray.

Collected only once and apparently rare in our region.

The var. *interjecta* Fern. has been collected southwest of our area in Sibley Twp. by Taylor, Losee & Bannan, No. 984, and northward in James B. on Charlton I. by A. E. Porsild, No. 4367. This variety may therefore be expected within the Clay Belt.

Habenaria clavellata (Michx.) Spreng.

LaS. open sphagnum bog (flowers in bud July 17, 1954), No. 5901.

This collection has the large lower leaf tapering to a sessile base of the northern var. *ophioglossoides* Fern.

Rare, collected only once in our area in an open sphagnum bog. Not reported northward.

Habenaria hyperborea (L.) R. Br.

NL. clay soil, rivershore ash-poplar woods, No. 5289; LaS. bog, black spruce woods (in anthesis June 29, 1952), No. 2889; Kap. small swamp dominated by *Equisetum variegatum*, No. 4994.

Frequent in a wide variety of habitats in low wet woods, wet open marsh and meadow, and bogs.

NL. thickets above alluvial shores, No. 5291; Amos, railway through poplar woods, No. 3009; Math. sedge marsh on silt, No. 4579; Kap. wet clearing on gravelly lake shore (in anthesis July 4, 1953), No. 5009.

These specimens differ from the typical state in their coarse growth, larger flowers, and long leaves and have been referred to var. *huronensis* (Nutt.) Farw. Tall plants are strikingly different from typical *H. hyperborea* and among them are sometimes found shorter individuals (No. 3009), which still have large flowers and long leaves.

This variety occurs in wet openings and clearings.

Habenaria dilatata (Pursh) Hook.

Math. sedge marsh on silt (in anthesis July 13, 1952), No. 3115; Kap. sedge marsh around small lake, No. 6126.

Rare, found on open sedge marshes at two widely separated points in the Clay Belt and numerous at both localities.

Habenaria orbiculata (Pursh) Torr.

VdO. lakeshore woods (in early anthesis July 10, 1952), No. 3065; Coch. old black spruce forest, No. 3925; LKap. aspen woods with *Acer spicatum*, *Diervilla Lonicera*, and *Aster macrophyllus*, No. 6092.

In No. 3925 the scape is bractless like the similar *H. Hookeri* Torr., but the flowers are pedicelled in a loose raceme, and the upper sepal is

Scarce, but occurring throughout the Clay Belt, floating between stems of marsh plants. Notably common on Lillabelle L., north of Cochrane, which is remarkably rich in aquatic vegetation.

XYRIDACEAE

Two species of *Xyris* have been collected at Temagami, which is only about 30 miles southwest of the Little Clay Belt. A specimen of *X. caroliniana* Walt. was collected by Geo. Vair, August, 1905 (the determination revised by J. H. Soper from *X. flexuosa* Muhl.). And *X. montana* Ries was collected by W. R. Watson, August 17, 1922. There is also a collection of *X. montana* from a place 127 miles north of Mont Laurier on the highway to Senneterre by Victorin, Germain & Blain, No. 251. This station may be just inside the southeastern margin of the Clay Belt. Both species probably will be found within the southern margin of our region.

ERIOCAULACEAE

Eriocaulon septangulare With.

VM. silted lake shore in 4 inches of water, No. 5968; Sen. silted margin of small sandy lake, No. 4386; Tas. on wet silted shore, No. 4333; Gog. silted shore of small lake (in early anthesis July 26, 1954), No. 6027.

Occasional in our region in shallow water on silted shores, sometimes stranded. Not reported northward.

PONTEDERIACEAE

Pontederia cordata L. has been collected in the Temagami Forest Reserve by C. E. Hindson, August 8, 1922. It may therefore be expected to occur in the L. Timiskaming portion of the Clay Belt, about 30 miles to the northeast.

JUNCACEAE

Juncus bufonius L.

VM. wet sandy clearing in birch woods, No. 5934; NL. sandy roadside through young jack pine – aspen poplar woods, No. 5260; VdO. clearing on river-bank (seeds dropping July 10, 1952), No. 3068.

Occasional in wet sandy places and spreading vigorously on roadsides and clearings.

Juncus Gerardi Loisel

Coch. railway yards, ditches, and waste ground, Nos. 3912, 4602, and (in anthesis July 19, 1952) No. 3404.

Locally adventive in Cochrane railway yards where there was a large colony. Reported northward at the south end of James B. by Potter (1934).

Juncus tenuis Willd.

NL. sandy roadside through young jack pine – aspen poplar woods, No. 5256; Amos, sandy lake shore (in late anthesis July 3, 1952), No. 2949; Math. roadside ditch through black spruce woods, No. 3185; Long. lake shore, No. 3569.

The above specimens have the flowers clustered at the tips of the branches placing them with the typical variety in the treatment of Gray's Man.

VdO. sandy lake shore, No. 4574; Kap. thickets along river shore, No. 3360.

These differ strikingly from the typical form in having very loose cymes with long branches bearing a few scattered flowers and are therefore referred to forma *discretiflorus* (F. J. Herm.) Fern.

VM. wet sandy clearing in birch woods, No. 5935; Tim. shore of small lake (seeds dropping August 15, 1952), No. 4015.

In these collections the cymes have arched-recurving branches bearing flowers on the upper side placing them with var. *Williamsii* Fern.

Juncus tenuis occurs commonly throughout the Clay Belt on shores of small sandy lakes and in ditches and clearings.

Juncus Dudleyi Wieg.

LTO. sandy shingle beach, No. 5235; Kap. shore of small lake, No. 4609; Long. bridge at Kenogami R. (capsules mature August 1, 1952), No. 3681.

Common throughout our region on open shores.

Juncus Vaseyi Engelm. has been collected close to the western limit of the Clay Belt at Flat Rock Portage, Nipigon R., John Macoun, July 20, 1884; and at Heron B., C. H. Ostenfeld, No. 610. It may occur within the margin of our area, possibly around Long L., although we did not see it. There is less likelihood of the occurrence within our region of *J. Greenei* Oakes, which was reported at Batchawana on L. Superior by Taylor.

Juncus filiformis L.

VdO. open sandy beach (seeds dropping August 18, 1953), No. 5512; Amos, on wet sand in jack pine forest, No. 2920; Arnt. sandy river shore, No. 2773; Math. muddy margin of pond, No. 3283; Hst. silted lake shore, No. 3785.

Common throughout the Clay Belt on sandy and silted shores and in wet openings and clearings in the forest.

Juncus effusus L.

VdO. ditch in black spruce forest, No. 3059; Amos, sandy lake shore (in anthesis July 3, 1952), No. 2948; Dup. alluvial shore, No. 4230.

This material has relatively loose and freely branched inflorescences and has been referred to var. *solutus* Fern. & Wieg., with which the New B. & B. includes varieties *Pylaei* (Laharpe) Fern. & Wieg., *decipiens* Buchenau, and *costulatus* Fern. as mere phases of this highly variable species.

Occasional on silted sandy shores and in ditches. Not reported northward.

Juncus balticus Willd.

Amos, sandy lake shore (in late anthesis July 1, 1952), No. 2909; and sandy shore of small lake, No. 5462; Math. sedge meadow on silt, No. 3120.

Occasional on sandy and silted lake shores. Our material is var. *littoralis* Engelm.

Juncus stygius L. var. *americanus* Buchenau has been rarely collected in this part of its range. Taylor reported it at Batchawana, and it was found westward on L. Superior at Peninsula by Taylor, Bannan & Harrison, Nos. 1050 and 1051. This species possibly will be found within the Clay Belt.

The Clay Belt lies within the eastern range of *Juncus longistylis* Torr. as shown in the map of DLD (p. 63) who report it as frequent on the lower Albany R. It has also been reported at Renison on the Moose R. by Hustich (1955). Although we did not find it, this species may occur rarely and locally in our area.

Juncus nodosus L.

NL. open alluvial shore of Elk L., No. 5296; Math. silted shore of small sandy lake (in anthesis July 13, 1952), No. 3141; Kap. gravelly shore of small lake (capsules mature August 8, 1954), No. 6111.

Occasional, forming extensive colonies on silted shores, occurring also on sandy and gravelly shores of small lakes.

Juncus canadensis J. Gay has been reported at Batchawana on L. Superior by Taylor. It may possibly extend northward to our region.

Juncus brevicaudatus (Engelm.) Fern.

NL. sandy roadside through young jack pine – aspen poplar woods, No. 5257; Sen. sandy shore of creek, No. 4642; Amos, sandy lake shore (in late anthesis July 3, 1952), No. 2950; Dup. margin of small lake, No. 4222; Tim. shore of small lake, No. 4016; Long. wet ditch through jack pine woods (ripe capsules opening August 1, 1952), No. 3691.

The material collected in 1953 at New Liskeard and Amos had many large deformities of the inflorescence which are probably insect galls, as illustrated by Fassett (p. 177, 1940),

Common throughout the Clay Belt on sandy and silted shores and in ditches and wet clearings.

Juncus brachycephalus (Engelm.) Buchenau

Long. silted shore of Phipps L. (capsules fullgrown July 30, 1952), No. 3622.

Rare, found only once at the western end of the Clay Belt. Not reported northward.

Juncus acuminatus Michx. has been reported at Batchawana on L. Superior by Taylor. It is possible that this species may be found within the southern margin of our region.

Juncus alpinus Vill.

LTO. shingle beach, No. 5210; Amos, railroad through poplar woods (in anthesis July 5, 1952), No. 3006; Math. sedge marsh on silt, No. 3123; Kap. gravelly shore of small lake (capsules mature August 8, 1954), No. 6112.

Common throughout the Clay Belt on gravelly and silted shores, and in wet ditches. Our material is var. *rariflorus* Hartm.

Juncus pelocarpus Mey.

Amos, silted lake shore, No. 5475, and silted clay shore, No. 5407; Tas. silted bay of sandy lake (oldest capsules mature and opening August 31, 1952), No. 4326.

Rare, found only at the eastern end of the Clay Belt.

Juncus subtilis Mey.

An excellent collection of this species from a typical Clay Belt lake was made in 1941, "bords du lac Tiblemont, 171 milles au nord de Mont-Laurier, Marie-Victorin, Rolland Germain & A. Blain, No. 67." We searched for it at L. Tiblemont in 1952 and at other similar habitats in the Clay Belt, without success. It is so small that it can be easily overlooked and is probably rare in our area.

Luzula acuminata Raf.

NL. young birch-poplar woods on wet limestone (seeds dropping June 11, 1952), No. 2467; Amos, trail through white spruce woods, No. 2924; Tas. black spruce – balsam fir forest, No. 5719; Tim. wet lakeshore aspen woods, No. 4777; Hst. alder thicket around beaver dam, No. 5635.

Common in woods in the L. Timiskaming portion of the Clay Belt, less frequent northward.

Luzula parviflora (Ehrh.) Desv.

NL. cedar woods, No. 2652; LWas. black spruce forest, No. 5740; Amos, railway ditch through poplar woods (seeds dropping July 5, 1952), No. 3005; Tim. gravel pit, clearing in black spruce forest, No. 4809; Hst. path through black spruce woods, No. 3723.

The above series and all other collections and observations had the tall, very lax cymes with black capsules of var. *melanocarpa* (Michx.) Buchenau.

Occasional throughout the Clay Belt in damp woods and clearings.

It is unlikely that *Luzula multiflora* (Retz.) Lejeune occurs within the Clay Belt. The nearest collection was made in Sibley Twp. by Taylor, Losee & Bannan, No. 334. This is the only specimen collected on the north shore of L. Superior by the Taylor and Hosie parties. The Clay Belt seems to lie between the range of *L. multiflora* and *L. sudetica* (Willd.) D.C. var. *frigida* (Buchenau) Fern.

LILIACEAE

Tofieldia pusilla (Michx.) Pers. has been collected on L. Superior at Peninsula by Taylor, Bannan & Harrison, Nos. 1155, 1156, and 1159 (distributed as *T. palustris*). It occurs frequently northward on both sides of James B. but was not seen by us within the Clay Belt.

Tofieldia glutinosa (Michx.) Pers.

Kap. highway ditch through black spruce forest, No. 3434, and wet, gravelly lakeshore clearing (capsules still unripe August 8, 1954), No. 6115.

Rare, found only at two localities near Kapuskasing in the western portion of our region.

ALLIUM SCHOENOPRASUM L.

Amos, roadside through farmland (in flower July 4, 1952), No. 2987.

This large specimen with leaves as long as the scape was taken from a clump of bulbs growing in a roadside ditch apparently persisting after being dumped there some years ago with garden trash. We saw nothing of the indigenous varieties in the Clay Belt, although var. *sibiricum* (L.) Hartm. has been reported south of our area from Batchawana on L. Superior by Taylor and north, from the west side of James B., by DLD.

HEMEROCALLIS FULVA L.

NL. abandoned farmstead (in flower July 22, 1952), No. 5252.

Persisting many years after abandonment of farmstead garden.

Lilium philadelphicum L.

LTQ. open, rocky lake shore, No. 4416; Kap. roadside through farm fields (in flower July 5, 1953), No. 5012; Hst. floor of deep valley in moraine, No. 3757; Long. roadside through black spruce forest (in fruit July 30, 1952), No. 3641.

The Clay Belt material has the orange flowers and mostly whorled lanceolate leaves of the typical variety, whose range extends north of our area.

Occasional in open dry woods and shores, and along roadsides.

Erythronium americanum Ker has been collected at Michipicoten on L. Superior by Hosie, Harrison & Hughes, Nos. 1800 and 1801. This species may extend to the southern margin of the Clay Belt.

Clintonia borealis (Ait.) Raf.

NL. young birch–poplar woods on wet limestone (in flower June 11, 1952), No. 2470; VdO. birch-spruce woods on lake shore, No. 3028; LAO. spruce–poplar forest, No. 4557; Kap. spruce-birch-poplar forest, No. 4984.

One of the commonest forest plants throughout the Clay Belt. Preferring well-drained sites with mixed coniferous-deciduous stands of trees but found also in wet black spruce forest up to the point where it becomes boggy.

Smilacina racemosa (L.) Desf.

LTQ. lakeshore thickets (fruit ripe September 10, 1952), No. 4420; NL. poplar-spruce woods on rocky outcrop (in flower June 17, 1952), No. 2669; Math. birch-spruce forest on rocky hilltop, No. 4827.

Common in the L. Timiskaming portion of the Clay Belt, rare northward and not reported beyond our region.

Smilacina stellata (L.) Desf.

LTO. damp elm-ash woods (in flower June 12, 1952), No. 2530; Dup. on lake shore of boulders and sand (in fruit August 20, 1952), No. 4095; Hst. clearing on river-bank, No. 3700.

Frequent on shores and river-banks throughout the Clay Belt forming large colonies in damp clearings.

Smilacina trifolia (L.) Desf.

NL. open labrador tea bog, No. 2567; OttR. open sphagnum bog (in fruit and some still flowering July 11, 1954), No. 5826; Tas. open black spruce bog (in anthesis June 10, 1954), No. 5686; Tim. sandy roadside through bog, No. 4762; Kap. old black spruce forest, No. 4893.

Common throughout the Clay Belt in open bogs, a characteristic plant of the floor of open black spruce muskeg forest, and extending a little into less boggy forest.

Maianthemum canadense Desf.

LTO. wooded trail along shore (in anthesis June 12, 1952), No. 2514; LMat. dry black spruce forest, No. 5796; Math. wooded bank above lake. No. 3136; Kap. cedar woods on creek shores, No. 5000.

The above collections are glabrous and represent the typical variety.

One of the commonest forest plants in the Clay Belt. Preferring well-drained sites but forming also extensive colonies on the floor of all types of forest above the level of the boggy black spruce lowlands.

LTO. wooded trail along shore (flowers in bud June 12, 1952), No. 2516; Gog. old red pine stand (in fruit July 25, 1954), No. 6003; Kap. spruce-birch-poplar forest, No. 4982; Long. trail through jack pine forest, No. 3667.

These pubescent specimens belong to var. *interius* Fern.

This variety is frequent at the western end of the Clay Belt, becoming rare eastward; not collected east of L. Timiskaming. Often growing with the typical variety but apparently preferring drier woodland habitats. Blooming a few days later than the typical variety when on the same site (Nos. 2514 and 2516.)

Disporum trachycarpum (S. Wats.) B. & H.

Hst. cut-over spruce-poplar woods, on steep bank of moraine below Rabbit L. fire-tower (in anthesis June 4, 1954), No. 5642; and at the same place (in fruit August 4, 1952), No. 3759.

Rare, found only once in the Clay Belt in a large colony near Hearst. This species is not listed in Gray's Man. Our collection was taken at lat. 49° 44 N'., long. 84° 17′ W., which is about 60 miles north of the northern boundary (49° N.) of the Manual range. *D. trachycarpum* has been reported once from northwestern Ontario by DLD from the Albany R. where Dutilly and Lepage collected it August 11, 1952.

Streptopus amplexifolius (L.) DC.

Math. creek-bank through spruce–balsam fir forest (in anthesis June 19, 1953), No. 4820; Tim. woods at lake outlet (fruit ripe August 15, 1952), No. 3993; Kap. old white spruce forest, No. 3469.

The above series and all other collections, with the single exception which follows, had the entire leaf margins of var. *americanus* Schultes.

Occasional in shoreline woods and old white spruce forest.

Coch. thickets around small lake (fruit ripe August 10, 1952), No. 3888.

This specimen has the minutely denticulate leaf margins of var. *denticulatus* Fassett.

Found only once in the Clay Belt where this upper Great Lakes variety probably reaches its northern limit.

Streptopus roseus Michx.

LTQ. cedar woods on springy hillside (in flower June 6, 1953), No. 4685; NL. damp poplar woods on limestone ridge, No. 2477; VdO. sandy lakeshore thickets (fruit ripe July 11, 1952), No. 3088; Tas. black spruce – balsam fir forest, No. 5718.

These specimens have the copiously ciliate leaves and matted rhizomes (No. 5718) of var. *perspectus* Fassett.

LTO. woodland trail along shore (in flower June 12, 1952), No. 2515; LAO. spruce-poplar forest, No. 2849; Kap. river-bank in cedar woods, No. 4910, and woods on river-bank, No. 3366.

In these specimens the leaves are less thickly ciliate and the rhizomes (No. 4910) root at the distant nodes, placing them with the var. *longipes* (Fern.) Fassett.

S. roseus (the varieties were not distinguished in the field) is common in rich damp woods and thickets throughout the Clay Belt.

Polygonatum pubescens (Willd.) Pursh.

LTQ. woods on muddy lake shores, No. 4463; LTO. rich woods, elm-ash (in flower June 12, 1952), No. 2527.

Rare and found only in the L. Timiskaming portion of the Clay Belt where this species reaches its northern limit in this longitude.

Trillium cernuum L.

LTO. rich woods, elm-ash, No. 2526; Tas. bank of stream through boggy black spruce forest (in anthesis June 11, 1954), No. 5714; Math. wooded ravine (in fruit July 16, 1952), No. 3201; Kap. hazel thicket in balsam poplar woods, No. 4881.

Common in rich deciduous woods of the L. Timiskaming portion, occasional on creek-banks and damp thickets elsewhere in the Clay Belt. Its northern limit is beyond our area at lat. 51° N. on the Harricanaw R., according to Dutilly and Lepage (1952).

Trillium undulatum Willd. has been collected at a place 117 miles north of Mont Laurier on the highway to Senneterre, which is close to the southeastern boundary of the Clay Belt; bois de *Picea mariana*, Victorin, Germain & Dominique, No. 292. It is possible that this species may also be found within the southern margin of our region. This species is listed by Hustich (1955) at Renison on Moose R.

IRIDACEAE

Sisyrinchium montanum Greene

NL. roadside at Creek culvert (in anthesis June 13, 1952), No. 2553; LWas. grassy clearing in aspen poplar – black spruce forest, No. 5773; LaS.

highway ditch through sedge marsh, No. 2826; Coch. rocky river-bank at falls (in fruit August 12, 1952), No. 4627; Tim. roadside ditch through farmlands, No. 4788.

Occasional on open shores, more frequently found in ditches and wet clearings. Our material is var. *crebrum* Fern.

Iris versicolor L.

LaS. floating margin of cat-tail marsh, No. 5877; LL. highway ditch at lake shore (first flowers June 19, 1952), No. 2723; Hst. silted lake shore (in fruit August 5, 1952), No. 3799.

Common throughout the Clay Belt in marshes and shores and occasionnally in very wet forest.

ORCHIDACEAE

Cypripedium arietinum R. Br.

VM. wet clay bank in pine woods (in anthesis June 7, 1953), No. 4719.

Rare, found only once in the L. Timiskaming portion of the Clay Belt where this species reaches its northern limit for this longitude.

Cypripedium Calceolus L.

NL. young poplar woods on wet limestone (in flower June 11, 1952), No. 2450, and clay-banked ravine, poplar-spruce woods, No. 2690; Tim. old black spruce forest, No. 4836; Kap. grass meadow around small lake, No. 4939.

These specimens have the smaller flower dimensions and few leaves of var. *parviflorum* (Salisb.) Fern.

Scarce but forming large colonies at widely separated points in the Clay Belt. Occurring in damp woods and open meadows.

LTQ. birch-aspen poplar woods, clay hillside (in flower June 6, 1953), No. 4703.

This specimen has five leaves up to 7 cm. wide, petals 7 cm. long, and is within the larger dimensions of var. *pubescens* (Willd.) Correll, as distinguished in the treatment of Gray's Man.

This variety was found only once in a large colony in the L. Timiskaming portion of the Clay Belt. Dutilly and Lepage (1952) report it north of our region on the Harricanaw R. at latitude 51° N.

Cypripedium acaule Ait.

LTQ. cleft in rocky lake shore (in flower June 6, 1953), No. 4691; NL. jack pine forest, No. 2599; Tas. rocky hillside in open jack pine woods, No. 5701; Amos, birch-spruce woods, No. 2896.

Occasional throughout the Clay Belt in jack pine forest and less commonly in dry mixed coniferous-deciduous woods and open rocky places.

Orchis rotundifolia Banks

LaS. bog, black spruce woods (in flower June 29, 1952), No. 4563.

Rare, collected at widely separated points in the Clay Belt at Timmins, sphagnum bog, F. N. Cowell, June 20, 1954, and at Kapuskasing in the

orbicular as in *H. orbiculata*. The range of *H. Hookeri* apparently does not extend northward into the Clay Belt.

Rare, in forest with good humus layer. Only one or two plants were found at each widely separated station. Collected also near Timmins by F. N. Cowell, July 8, 1955. Not reported northward.

Habenaria obtusata (Pursh) Richards.

Amos, white spruce woods (in anthesis July 3, 1952), No. 2960; LAO. spruce-poplar forest, No. 2841; Kap. aspen poplar – balsam fir woods, No. 5020; Long. black spruce forest, No. 3675.

Scarce, in spruce forest and mixed spruce – balsam fir – poplar throughout the Clay Belt.

LAO. spruce-poplar forest (in early anthesis June 28, 1952), No. 4661.

These plants differ from the typical state, with which (No. 2841) they were growing, in having the leaf longer than or nearly equalling the scape, placing them with var. *collectanea* Fern.

This variety rare, found only once in our area.

Habenaria lacera (Michx.) Lodd. has been reported on L. Superior at Baichawana by Taylor. This species may possibly extend to the southern margin of the Clay Belt.

Habenaria psycodes (L.) Spreng.

NL. thickets above alluvial shore (in anthesis July 25, 1953), No. 5295; Sen. river shore at falls, No. 4643; Tim. thickets around boggy lake, No. 4004; LKap. sandy and rocky river shore below thickets, No. 6064.

Scarce, although occurring in large colonies along open shores of rivers and lakes on the open side of thickets.

Pogonia ophioglossoides (L.) Ker has been collected at several localities on the north shore of L. Superior; the nearest to our region being Michipicoten: Hosie, Harrison & Hughes, Nos. 1937 and 1938. It is possible that this species will be found within the southern margin of the Clay Belt.

Calopogon pulchellus (Salisb.) R. Br.

Sen. shore of boggy pool (in fruit September 7, 1952), No. 4393.

Rare, found only once in the Clay Belt. Not reported northward.

Mr. Garnet, a long-time resident of Hearst, described to us a kind of orchid that he had seen for the first time 10 miles northwest in Hanlan Twp., which probably was *Arethusa bulbosa* L. Next day we hunted for it together, and although we saw much *Calypso bulbosa*, which Mr. Garnet knew, we could not relocate the *Arethusa* in open alder thickets on muskeg. It is almost certain that *A. bulbosa* occurs in the Clay Belt, although rare and local. It has been collected as close to our region as Schreiber on L. Superior by Hosie, Losee & Bannan, No. 1774.

Spiranthes lacera Raf.

Hail. young pine woods above gorge, on moss-covered rocks (in flower July 31, 1953), No. 5367.

This collection is distinguished from the similar southern *S. gracilis* (Bigel.) Beck by having the thin leaves present at flowering time, an

elongate series of flowers with the dilated summit of the tip having a broad white border.

Rare, found only once in the L. Timiskaming portion of the Clay Belt, which probably is the northern limit of the species in these longitudes.

Spiranthes Romanzoffiana Cham.

Amos, sandy silted lake shore, No. 5389; Dup. thickets on lake shore of boulders and sand, No. 4096; Tim. sedge meadow around bog, No. 4078; Kap. boggy clearing beside stream (in flower July 21, 1952), No. 3415.

Scarce, on open shores, in thickets and wet meadows, throughout the Clay Belt.

Goodyera repens (L.) R. Br.

Tas. black spruce forest on rocky hillside, No. 4252; LKap. trail through black spruce forest, No. 6057; Kap. old white spruce forest, Nos. 3463 and 4664; Long. black spruce forest (in flower July 31, 1952), No. 3674.

These collections all have the white-reticulate leaves of var. *ophioides* Fern. The deeply saccate lips of the flowers and the smaller dimensions throughout separate them from the similar *G. tesselata*.

Scarce in damp spruce forest throughout the Clay Belt.

VdO. poplar spruce woods, lake shore, No. 5546; Tim. pine forest on lake shore, No. 4663.

These specimens were collected in drier habitats in mid-August, and it is doubtful whether their coarseness and the shape of the lips of the flowers are sufficient to place them with *G. tesselata*.

Goodyera tesselata Lodd.

VdO. poplar-spruce woods, lake shore, No. 5510; Tas. jack pine woods beside inlet river at Chicobi L., No. 4264; Long. jack pine woods (in flower July 29, 1952), No. 3561.

These coarser plants with longer leaves and shallower lips have been referred to *G. tesselata*.

Scarce, in jack pine forest, throughout the Clay Belt and in relatively drier habitats than the similar *G. repens* var. *ophioides*. This species is listed by Hustich (1955) north of our region on the Moose R.

Coch. old black spruce forest, No. 3926; Tim. pine forest on lake shore (with No. 4080), No. 4663; Long. black spruce woods at lake shore, No. 3626.

The above collections are another series of doubtful determinations for the same reason as in the case of some specimens placed with *G. repens* var. *ophioides*.

Two additional species of *Goodyera* have been reported at Batchawana on L. Superior by Taylor. These are *G. decipiens* (Hook.) Hubbard (*G. oblongifolia*, Gray's Man.), and *G. pubescens* (Willd.) R.Br. They are worth listing as species whose range may possibly extend to the southern margin of the Clay Belt.

Listera cordata (L.) R.Br.

Kap. lakeshore thickets (in flower July 22, 1952), No. 3425.

Rare in the Clay Belt. It was also collected near Kapuskasing by Millar & Bonner, No. 63, and near Timmins by F. N. Cowell, May 28, 1955.

Listera auriculata Wieg.

VdO. spring bank on lake shore (in flower July 8, 1952), No. 3031.

Rare in the Clay Belt. It has also been collected near Timmins by F. N. Cowell, July 6, 1952.

Listera convallarioides (Sw.) Nutt. has been collected at several stations on the north shore of L. Superior, the nearest to our region being Schreiber by Hosie, Losee & Bannan, No. 1759 (revised from *L. auriculata* by A. E. Porsild). This species probably will be found within the Clay Belt.

Corallorhiza trifida Chatelain

Hail. hazel thicket on river-bank, No. 5623; Amos, young poplar-spruce woods (in anthesis June 8, 1954), No. 5663; LL. wet ashwoods, No. 2737; Kap. lakeshore thickets (capsules fullgrown July 22, 1952), No. 3426.

Frequent in damp woods and shore thickets throughout the Clay Belt.

Corallorhiza maculata Raf.

LAO. spruce-poplar forest (in anthesis June 28, 1952), No. 2844; LKap. trail through black spruce forest, No. 6058.

Rare, in relatively dry forest in our region.

Corallorhiza striata Lindl.

NL. thin soil on limestone, pastured mixed woods (in anthesis May 27, 1954), No. 5553; Kap. hazel thicket in balsam poplar woods, No. 4882, and old aspen woods, mountain maple understory, No. 4955.

Scarce, in rich woods. Not reported northward.

Malaxis brachypoda (Gray) Fern.

M. monophylla, New B. & B.

LTQ. lake shore, woods (in fruit September 10, 1952), No. 4417.

Long past flowering, this specimen is distinguished from *M. unifolia* by its slender raceme and clasping leaf.

Rare, a single plant was collected in the L. Timiskaming portion of the Clay Belt. Probably at or near the northern limit of its range for this longitude.

Malaxis unifolia Michx.

Amos, black spruce woods around bog (in anthesis July 6, 1952), No. 3021; Tas. black spruce woods, No. 4317; Dup. crevice in rocky outcrop, No. 4123.

Rare and so far found only in the Quebec portion of the Clay Belt. Not reported northward.

Calypso bulbosa (L.) Oakes

Hst. cut-over balsam fir – white spruce woods (in flower June 3, 1954), No. 5641.

Apparently rare, and seen only in one year in the vicinity of Hearst where it was locally surprisingly frequent in the drier spruce forest. Flowering very early, and afterwards inconspicuous, it was probably overlooked elsewhere in the Clay Belt. It was also collected near Kapuskasing by Millar & Bonner, No. 6.

SALICACEAE

Salix amygdaloides Anderss. Peachleaf Willow

A leafy twig of this species was collected in 1933 in the L. Timiskaming portion of the Clay Belt near Ville Marie, au bord du petit lac Laperrière, Victorin, Germain & Meilleur, No. 48,939. As the shores of this lake are now largely occupied by summer cottages, we could not relocate the tree in 1952, nor did we see this species elsewhere in the Clay Belt, where it is evidently at the northern limit of its range for this longitude.

SALIX PENTANDRA L.

NL. deep ravine under bridge, No. 2687; Tim. planted around houses at forestry base (with catkins June 22, 1953), No. 4860.

This is the most popular and successful tree introduced in the Clay Belt for planting along highways and streets, and for windbreaks on farms. Although very commonly planted in the settled parts of our area, it rarely escapes as in No. 2687, where, probably, a branch from the highway plantation had fallen into the ravine. DLD report it northward at Moosonee.

Salix lucida Muhl.

NL. thickets on wet sandy clearing (in flower June 13, 1952), No. 2548; LWas. thicket on flooded gravel bar, No. 5770; Amos, clearing on river-bank (in fruit July 2, 1952), No. 2944; Tim. lake shore, No. 4034; Long. lake shore at inlet river, No. 3594.

These specimens represent the typical variety with long-attenuate, glabrous, mature leaves.

Common throughout the Clay Belt along shores, around marshes and clearings.

VM. lake shore, No. 4533; Tas. clearing above river-bank, No. 4304.

These collections (too late for catkins) have the narrowly lanceolate leaves of var. *angustifolia* Anderss., which occurs much less frequently than the typical variety.

Dup. lake shore, silted bay, No. 4112; LAO. sandbar at creek outlet, thickets (in fruit July 14, 1953), No. 5019, and sandy silted lake shore, No. 5135.

These collections have the hairy young branches and lower leaf surfaces of var. *intonsa* Fern.

Like var. *angustifolia* this is much less frequent than the typical variety.

Salix serissima (Bailey) Fern.

NL. thickets on wet sandy clearing, No. 2547; LaS. roadside through black spruce bog, No. 2877; Math. margin of sedge marsh (in fruit July 13. 1952), No. 3132; Tim. margin of wet open sedge meadow (in flower June 15, 1953), No. 4796; Long. lake shore at inlet river, No. 3593.

Occasional, around wet sedge meadows, boggy openings, and clearings, throughout the Clay Belt.

SALIX FRAGILIS L. Crack Willow

Tim. shore of boggy lake near clearing (with immature catkins June 13, 1953), No. 4767.

This collection was made from a shrubby tree, presumably an escape from a nearby clearing. Not reported north of our region.

SALIX ALBA L. White Willow

VM. lake shore beyond summer cottages presumably well escaped. No. 4526, and from the road nearby beside a ditch to lake shore through fields, pollarded tree 35 feet high, No. 5980.

These specimens (too late for catkins) have yellow branchlets with mature leaves, whitened beneath. They match material called var. VITELLINA (L.) Stokes. According to the New B. & B., this variety, as found in their country, is mostly a hybrid of S. ALBA and S. FRAGILIS.

This willow, planted occasionally in the vicinity of L. Timiskaming, has rarely escaped. Not seen in the northern portion of the Clay Belt.

Salix interior Rowlee

LTQ. roadside thickets below rocky hill, No. 4451; Long. sandy lake shore, No. 3657; Ger. sandy shore of Ogoki L. (with catkins August 13, 1954), No. 6145.

This material has the linear glabrate leaves of the typical variety.

Rare, found only at three widely separated points in the Clay Belt on sandy shores and roadside below a rock knob.

LTO. sandy beach, No. 5238.

This specimen has the shorter, broader, permanently (July 21) silky leaves of forma *Wheeleri* (Rowlee) Rouleau.

Salix MacCalliana Rowlee

Tim. roadside through wet black spruce forest, No. 4011; Long. roadside through black spruce forest, No. 3572.

Both these collections have old catkins with long opened capsules (July 29, August 15, 1952) that match western material of the same age.

Rare, recognized in the field by A. J. Breitung. The Timmins collection lies inside the northern boundary of the range of Gray's Man. in which this species is not listed. These collections represent a small southeasterly extension of the range of *S. MacCalliana* given in the map of DLD (p. 70).

Salix pyrifolia Anderss.

NL. thickets on wet sandy clearing, No. 2545; Tas. margin of black spruce bog (shedding pollen June 10, 1954), No. 5688; LaS. highway ditch through sedge marsh (capsules opening June 27, 1952), No. 2829; Tim. shore of boggy lake, No. 4765; Kap. boggy clearing beside stream, No. 3411.

Frequent throughout the Clay Belt around open bogs and marshes, and in ditches and boggy clearings.

Salix cordata Michx.

Not *S. cordata* Muhl.

LTQ. roadside thickets below rocky hill, No. 4450; Kap. boggy clearing beside stream, No. 3419; Hst. roadside clearing, No. 3737.

Collected at three widely separated points in our region and apparently scarce.

Salix rigida Muhl.

Not *S. cordata* Michx.

NL. deep clay ravine, above river, tree 18 feet high, No. 5607, and from the same locality on clay river-bank (capsules bursting June 14, 1952), No. 2578.

Collected at only one locality in a rich, wooded ravine of the Englehart R. in the Little Clay Belt. Reported as fairly frequent northward in the James B. area by DLD.

LTQ. covering shingle bar off point of Mann I., No. 4501.

This mature (September 12, 1952) specimen, with old remnants of male catkins, has narrow leaves and other characters suggesting var. *angustata* (Pursh) Fern., to which it is doubtfully referred.

Salix lutea Nutt.

Tim. thickets around sedge meadow, No. 4067.

This mature specimen (August 17, 1952) with no catkins has the yellowish colour and firm leaves with cordate to rounded bases which place it with *S. lutea*.

Found only once and apparently rare in the Clay Belt.

Salix myrtillifolia Anderss.

Long. roadside, through black spruce forest, No. 3573 and No. 3642 (catkins with old opened capsules July 30, 1952).

Found only at two places on the Trans-Canada Highway at the western end of the Clay Belt.

Salix pseudomonticola Ball

NL. clay river-bank at bottom of ravine (old catkins falling off June 14, 1952), No. 2577; Coch. river-bank, No. 3961; Hst. thickets on river-bank, No. 3746; Long. roadside clearing, No. 3605.

Occasional throughout the Ontario portion of the Clay Belt on river-banks and in clearings. At New Liskeard it is within the northern boundary of the range of Gray's Man., in which it is not listed.

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Salix Bebbiana Sarg.

LTO. sedge meadow behind sand beach (shedding pollen May 28. 1954), No. 5579; LMat. rocky summit of Mont Laurier, No. 5805; Amos, road through white spruce woods, No. 2935; Coch. bank above boggy lake. No. 5176; Tim. shore of boggy lake, No. 4770; Kap. open sedge meadow (capsules opening July 3, 1953), No. 4989.

Probably the commonest willow throughout the Clay Belt, occurring in a wide variety of habitats from exposed rocky hilltops and shores, in openings in the forest, to river-banks, meadows, shores of boggy lakes, and in clearings. It starts to fruit in open places when only 2 to 3 feet high.

Salix pedicellaris Pursh

NL. black spruce-larch bog, No. 2559; Amos, border of *Chamaedaphne* bog (capsules opening July 4, 1952), No. 2993; LaS. floating margin of cat-tail marsh, No. 5878; Math. border of sedge meadow, No. 3149; Kap. sedge marsh around small lake, No. 6125.

This series represents var. *hypoglauca* Fern. with leaves whitened, glaucous beneath.

Frequent throughout the Clay Belt in bogs, wet sedge meadows, and margins of marshes.

Kap. sedge marsh around small lake (capsules opening June 28, 1953), No. 4932.

This specimen has the long oblanceolate leaves and open catkins of var. *tenuescens* Fern.

Found only once and apparently rare. The Clay Belt is outside the range of var. *tenuescens* given in Gray's Man. Our material, however, matches specimens referred to this variety from Riverton, Manitoba, H. J. Scoggan, No. 9152, and from Wood Buffalo Park, Alberta, H. M. Raup, No. 2103.

Salix discolor Muhl.

NL. ditch through dwarf birch-leatherleaf bog (shedding pollen May 29, 1954), No. 5600, and from the same place with female catkins, No. 5598; Dup. roadside through wet black spruce forest, No. 4639; Coch. sedge meadows, No. 5186; Tim. shore of boggy lake, No. 4771; Kap. river shore, No. 3387.

Very variable in the Clay Belt. Usually a small shrub but growing sometimes to tree size (No. 4639 was 40 feet high). Leaves irregular in shape, serration of margin, and width (No. 3387 very narrow and long).

Common in wet woods, shores, and clearings throughout our area.

Salix humilis Marsh.

NL. sandy jack pine woods, No. 2593; Amos, jack pine forest on sand, No. 4566, and open spruce-jack pine woods (capsules starting to open before leaf buds expanded June 8, 1954), No. 5660; Tim. clearing in jack pine forest, No. 4050.

In this material the undersides of the obovate to oblanceolate leaves have a very dense tomentum, placing it with var. *keweenawensis* Farw.

Frequent throughout our region as a characteristic shrub of the jack pine forest.

Salix gracilis Anderss.

S. petiolaris, New B. & B.

NL. thickets on wet sandy clearing, No. 2546, and ditch through dwarf birch-leatherleaf bog, No. 5596; LWas. above willow thicket (capsules opening June 28, 1954), No. 5771; LAO. rocky river shore at rapids, No. 5173; Math., border of sedge marsh, No. 3146; Tim. shore of boggy lake, No. 4766.

All this material has the entire or obscurely denticulate leaves of the typical variety that in the treatment of Gray's Man. includes *S. petiolaris*, var. *rosmarinoides* (Anderss.) Schneid. and var. *angustifolia* Anderss.

LaS. roadside through black spruce bog, No. 2880; Amos, river shore, No. 2943; LAO. sandbar at creek outlet, thickets, No. 5110; Math. margin of flood meadow below falls, No. 3174; Tim. lake shore, No. 4028.

These specimens have the leaves strongly serrate-dentate, with gland-ripped teeth, placing them with var. *textoris* Fern. This willow has been reported at Moosonee by DLD:

S. gracilis and var. *textoris* occur occasionally on shores, wet openings, and clearings throughout our region.

Salix candida Flügge

NL. thickets on wet sandy clearing, No. 2544; Math. thickets around lake, No. 3129; Tim. margin of open sedge marsh (capsules opening June 15, 1953), No. 4794; Gog. lakeshore sandbar in *Myrica* thicket, No. 5996.

Occasional throughout the Clay Belt around open sedge marshes, lake shores, and wet clearings.

Math. thickets around lake, No. 3139.

This specimen has the glabrescent leaves of forma *denudata* Anderss.

Rare, occurring with the typical form.

Salix planifolia Pursh

NL. drainage ditch through bog, No. 4549; Dup. roadside through wet black spruce forest, No. 4165; Arnt. roadside through black spruce bog, No. 2761; Tim. open margin of sedge marsh, No. 4789; Hst. cut-over spruce poplar woods on steep sandy bank (female catkins well developed before leaf buds expanded June 4, 1954), No. 5643; Long. lake shore, No. 3592.

Common throughout the northern portion of the Clay Belt but only occasional in the L. Timiskaming portion. Occurring commonly on the open margins of wet meadows around lakes, in wet clearings in the forest, and often forming a thicket zone along river shores.

Salix pellita Anderss.

NL. rivershore thickets (with old catkins June 14, 1952), No. 2589; Amos, river shore, No. 2945; LaS. lake shore, No. 2815; LAO. sandbar, No. 5148; Math. river shore, No. 3250.

Common, often forming extensive thicket zones on river shores and sandbars in lakes in the northern portion of the Clay Belt, less frequent in the L. Timiskaming area.

Sen. rivershore thickets, No. 4357; LWas. forming extensive thickets on river delta (late formed catkins present June 26, 1954), No. 5745; Math. river shore, No. 3251.

These specimens have leaves glabrescent and white beneath and belong to forma *psila* Schneid.

Less common than the typical form and occurring in the same habitats.

Populus tremuloides Michx. Trembling Aspen or Aspen Poplar

NL. young poplar woods on limestone ridge, No. 2458; Kap. river shore, No. 3376; Hst. grove of young trees on outskirts of town (ripe capsules beginning to open and the young leaves to expand June 4, 1954), No. 5652.

The size and texture of the leaf vary greatly. On one tree (No. 3376) can be found coarse large leaves up to 9 cm. wide, middling size coriaceous leaves around 4 cm. wide, and membranaceous leaves from 2 to 3 cm. wide. Field observations did not warrant the separation of our material into forms.

Abundant throughout the Clay Belt, constituting about 10 per cent of the forest. Commonly mixed with spruce on better-drained sites, often forming nearly pure stands following fire or clearing. Frequently old trees are seen standing by themselves where pulpwood cutting has removed the more desirable spruce and balsam fir. This feature of selective cutting will probably change as the use of poplar for pulpwood increases. The pioneer growth of poplars on burns and clearings frequently nurses an understory of spruce and balsam fir which shades the intolerant young poplars and suppresses their regeneration.

Populus grandidentata Michx. Largetooth Aspen

VM. open red pine woods, No. 4704; Hail. seedling trees, opening in pine woods (leaves beginning to expand May 30, 1954), No. 5622; NL. young poplar woods on limestone ridge, No. 2459.

Frequent in open, red and white pine woods and clearings in the L. Timiskaming portion of the Clay Belt where this aspen reaches its northern limit for these longitudes.

Populus sp.

Kap. tree 30 feet high, planted on city street, No. 3511.

This introduced tree, with leaves suggesting cottonwood, is probably a horticultural variety or hybrid brought in for decorative purposes.

Populus balsamifera L. Balsam Poplar

NL. young poplar woods on limestone ridge, No. 2460; Amos, copse in farmland (catkins fullgrown with leaves expanded June 8, 1954). No. 5676; Dup. river shore, No. 4232.

Common on low ground throughout the Clay Belt and making up about 3 per cent of the total forest. Frequently forming pure stands along shores of rivers and lakes. Balsam poplar is also the main tree of small

copses on the farmlands of our area following clearing of the land. Cattle are frequently put to graze in the woodlots, which are remarkably poor in other species. Balsam poplar is also planted commonly around farmsteads and settlements.

Dup. river shore, No. 4234; Tim. waste land in town, No. 4092; Kap. river shore No. 3382.

These specimens with cordate leaf-bases represent var. *subcordata* Hylander, which, although less frequent, often grows side by side with the typical variety (Nos. 4234 and 4232) and may not be sufficiently distinct to warrant segregation as a variety.

MYRICACEAE

Myrica Gale L.

Amos, river shore, No. 3020; Tas. sandspit at lake narrows, No. 5712; Arnt. lake shore, No. 2788; Hst. thickets in rivershore meadow (pollen shedding June 2, 1954), No. 5631.

Common throughout the Clay Belt forming thicket zones on shores of lakes and rivers, margins of marshes, and in wet clearings.

Kap. river shore, No. 3513.

This specimen has the glabrous leaves of var. *subglabra* (Chev.) Fern., which was seen only once.

Comptonia peregrina (L.) Coult.

Myrica asplenifolia, New B. & B.

NL. clearing in jack pine woods (pollen shedding May 29, 1954), No. 5595; OttR. red pine stand on river-bank, No. 5872; Amos, on sand in jack pine forest, No. 2900; IF. open jack pine woods, No. 5052.

Common in dry clearings and locally abundant in sandy jack pine forest where it often forms the chief ground cover layer in openings. Not reported north of the Clay Belt.

JUGLANDACEAE

The range of *Juglans cinerea* L. extends up the Ottawa Valley nearly reaching L. Timiskaming, according to the map in "Native Trees of Canada" (1949). It is possible that an outlying tree will be found in the L. Timiskaming portion of the Clay Belt.

CORYLACEAE

Corylus cornuta Marsh

VM. open pine woods, No. 4711; NL. young poplar woods on limestone ridge, No. 2461; Tas. hilltop in stunted birch woods (flowering with leaves expanding June 11, 1954), No. 5698; IF. young poplar woods on clay, No. 5047; Kap. river-bank thickets, No. 3300.

Common in open woods and abundant in the L. Timiskaming portion as the chief shrub understory of the young poplar woods. Probably near or at its northern limit for this longitude. Reported on the Harricanaw R. by Dutilly and Lepage (1952). This river drains northward through our area to James B.

Ostrya virginiana (Mill) K. Koch Ironwood

VM. birch-poplar woods, No. 4507.

This material, from a non-fruiting tree, has the stipitate glands on new branchlets of forma *glandulosa* (Spach) Macbr.

Found only once in birch-poplar woods in the L. Timiskaming portion of the Clay Belt where ironwood reaches its northern limit for this longitude.

Betula lutea Michx. f. Yellow Birch

VM. opening in red pine woods (male catkins with pollen shed June 7, 1953), No. 4717; Hail. ash-red maple woods (fruiting catkins fullgrown July 31, 1953), No. 5374; VdO. stand of big trees on creek-banks, No. 3067.

Scarce in the L. Timiskaming portion of the Clay Belt and occurring rarely a little northward. Growing to 50 feet in height, 8 inches in diameter. Yellow birch evidently reaches its northern limit just inside the southern boundary of our area.

Betula minor (Tuckerm.) Fern.

LL. in alder thicket around open bog, No. 2755; Kap. thickets around small lake (fruiting catkins fullgrown July 22, 1952), No. 3441.

Collected only twice at two widely separated points in the Clay Belt and apparently rare. Growing 12 to 15 feet high in alder thickets.

Betula papyrifera Marsh. White Birch

NL. clay river-bank (catkins fully developed July 29, 1953), No. 5342; LWas. river-bank, No. 5753; Dup. lake shore, No. 4105; Tim. open, clay river-bank (male catkins having shed pollen June 21, 1953), No. 4857; Kap, rock outcrop on river shore, No. 3340.

Abundant, constituting about 5 per cent of the forest in typical Clay Belt country. Preferring well-drained shores of lakes and rivers, and occurring commonly on hillsides, openings in the forest and in clearings, especially following fires.

Amos, poplar-birch woods on rock, No. 3022; Tas. old stands in black spruce forest on rocky hillside at Chicobi L. fire-tower (catkins mature August 27, 1952), No. 4258; LAO. spruce-birch forest on rocky hilltop, No. 5100; LL. spruce-poplar forest on rocky outcrop, No. 2703; LKap. rock and gravel top of Mt. Horden, No. 6062.

These specimens have the cordate-based leaves of var. *cordifolia* (Regel) Fern.

This variety occurs occasionally, preferring rocky hilltops, hillsides, and outcrops. Much less frequent than the typical variety, and sometimes growing with it on hillsides.

Betula borealis Spach

Kap. river shore, No. 3375 (det. A. E. Porsild); Ger. sand beach (fruiting catkins fullgrown August 11, 1954), No. 6135.

Collected only twice at the western end of the Clay Belt and apparently rare.

Betula pumila L.

NL. thickets in bog with *Chamaedaphne* (male catkins shedding pollen May, 29, 1954), No. 5599; LWas. alder thicket on boulder lake shore, No. 5760; Tas. wet black spruce woods, No. 4322; LaS. highway ditch through sedge marsh, No. 2834; IF. thickets in wet black spruce forest, No. 5063; Kap. boggy clearing beside stream, No. 3420; Long. thickets on silted lake shore (fruiting catkins mature July 30, 1952), No. 3629.

Abundant, forming extensive thickets on wet boggy land, occurring typically around bogs and marshes, in openings in the black spruce forest, on shores (often with alders), and in boggy clearings. Our material is var. *glandulifera* Regel (*B. glandulosa* var. *glandulifera*, New B. & B.).

Alnus crispa (Ait.) Pursh Green Alder

NL. birch–jack pine woods (male catkins shedding pollen May 29, 1954), No. 5592; Sen. shore of small sandy lake, No. 4383; Amos, on sand in jack pine forest, No. 2912; Tas. shore of sandy lake (fruiting catkins mature August 31, 1952), No. 4332; IF. lakeshore woods, jack pine and birch, No. 5050.

All our material has the permanent soft pubescence on leaves and young branches of the eastern var. *mollis* Fern.

Common throughout the Clay Belt in sandy jack pine forest, also forming thickets around sandy lakes, on moist clay in black spruce stands, and occurring in drier sites in the forest.

Alnus rugosa (DuRoi) Spreng. Speckled Alder

NL. thickets around small lake, No. 4552; Amos, road through black spruce bog, No. 2894; LAO. rivershore thickets, No. 5089; IF. thickets in wet black spruce forest, No. 5057; Kap. river shore, No. 4599.

The most abundant shrub of the Clay Belt, it occurs in wet openings throughout the characteristic wet black spruce forest of our region. Forming great thickets on low shores, in wet flat country, and in wet clearings. Our material is var. *americana* (Regel) Fern.

FAGACEAE

Reports from foresters of beech occurring in the Ottawa Valley northward from Mattawa toward L. Timiskaming suggested that *Fagus grandifolia* Ehrh. might be found as a rare tree just within the southern margin of the Clay Belt. We searched carefully in the Little Clay Belt without success. There remains the possibility that beech may have been cleared out in the settlement of this farmland.

Quercus macrocarpa Michx. Bur Oak

LTQ. clearing on lake shore, No. 4414, and creek-bank near lake shore, No. 4400; NL. old tree in young poplar woods following fire, No. 2699.

No fruiting trees were found, nor were their acorns on the ground. The veteran tree, No. 2699, was 40 feet high and 14 inches in diameter.

Rare; its former sites evidently cleared for farmlands. Found only in the L. Timiskaming portion of the Clay Belt where it reaches its northern limit for this longitude.

Quercus rubra L. Red Oak

Q. borealis, New B. & B.

LTQ. hillside, No. 4465; Hail. young pine woods above rocky gorge, No. 5368, and top of rock cliff (leaves expanding May 30, 1954), No. 5617.

No flowers or fruit were seen.

The northern red oak, like the bur oak, reaches its northern limit in the L. Timiskaming portion of the Clay Belt where it is now rare following clearing of the land for farming and mining. Our material is var. *borealis* (Michx. f.) Farw.

ULMACEAE

Ulmus rubra Muhl. has been reported at Batchawana on L. Superior by Taylor (1938). We therefore looked carefully for slippery elm, particularly in the vicinity of L. Timiskaming, and collected from rough-leaved elms, which suggested this species. All fruiting specimens, however, collected and observed by us, and by Messrs. G. M. Mills of New Liskeard, F. N. Cowell of Timmins, E. K. E. Dryer of Cochrane, and S. R. Suter of Kapuskasing, had the distinctive deep notch at the top of the fruit of the white elm. The main range of *U. rubra* does not reach the Clay Belt, although it is possible that outlying trees may yet be found within the southern margin.

Ulmus americana L. White Elm

LTQ. lake shore (fruits mature June 9, 1953), No. 4741; NL. meadow on west slope of limestone ridge, No. 2659; Arnt. sandy field above river, No. 2774; Tim. bank of Mattagami R. (same tree in flower May 1, and fruit May 11, 1955, collected by F. N. Cowell), No. 3985; Hst. elm-ash woods (same stand in fruit June 6, 1955, collected by S. R. Suter), No. 6127.

Common in the L. Timiskaming portion of the Clay Belt in farmlands, on lake shores, and in low woods associated with ash. Occasional northward where it is usually found with *Fraxinus nigra* on alluvial shores of lakes and rivers.

In the southern portion of our area, white elm grows to a fine tree, occurring very much as it does in southern Ontario and Quebec. Northward it is usually somewhat stunted and restricted to the characteristic ash-elm groves of alluvial shores, where it (No. 6127) can still grow to 60 feet high and 24 inches in diameter. McInnes (1909) reported the northern limit of white elm at lat. 51° 30′ N. on the Albany R.

CANNABINACEAE

Humulus Lupulus L.

NL. roadside through fields, No. 5283.

Found only once on a roadside where it had evidently escaped from nearby settlements. The L. Timiskaming portion of the Clay Belt is possibly the northern limit in this longitude where the common hop can persist.

URTICACEAE

Urtica gracilis Ait.

U. dioica var. *procera*, New B. & B.

Kap. beside creek (in anthesis July 20, 1952), No. 3352.

This collection has the stem sparingly pilose above, placing it with *U. gracilis* in the treatment of Gray's Man. There is a similar specimen from the Clay Belt of northern Quebec collected at La Reine by Marie-Victorin, Rolland-Germain & R. Meilleur, No. 44,985, distributed as *U. procera.*

Scarce, on creek-banks, wet shores, and in ditches.

Urtica procera Muhl.

U. dioica L. var. *procera,* New B. & B.

VM. roadside through fields, No. 5285; Math. rivershore thickets (in anthesis July 17, 1952), No. 3269.

This material has the strongly cinereous pilose stem of *U. procera* in the Gray's Man. treatment. In the New B. & B. it is placed with the very similar *U. gracilis* under *U. dioica* var. *procera.*

Not distinguished in the field from *U. gracilis* and therefore without separate notes on frequency or habitat preferences. Not reported northward.

Laportea canadensis (L.) Wedd.

LTQ. lakeshore thickets, No. 4468; LTO. ash-elm woods (in anthesis July 22, 1953), No. 5244.

Rare, found only in thickets and low woods on the shores of L. Timiskaming where this species evidently reaches its northern limit for this longitude.

SANTALACEAE

Comandra Richardsiana Fern. was reported from Batchawana on L. Superior by Taylor but was seen nowhere in the Clay Belt. This species may possibly occur within the southern margin of our region.

Geocaulon lividum (Richards.) Fern.

Comandra livida, New B. & B.

WasR. aspen poplar – birch woods, lake shore, No. 5784; LAO. young black spruce – poplar forest (in flower June 28, 1952), No. 4558; Kap. balsam poplar – alder woods on lake shore, No. 6120; Long. black spruce forest (in fruit July 30, 1952), No. 3640.

Occasional in a variety of woodland habitats. Found only at widely separated points in the northern portion of the Clay Belt.

LORANTHACEAE

Arceuthobium pusillum Peck

Sen. black spruce forest (with fruit September 6, 1952), No. 4374; Hst. on black spruce, old stand, No. 6131.

Collected at two widely separated points in the Clay Belt where it was infesting many acres of old, poorly growing, black spruce forest. Parasitized stands of trees could be recognized usually by turned-up, bushy, side branches. There are no records of this species north of our region.

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PLANTS OF THE CLAY BELT OF NORTHERN ONTARIO AND QUEBEC

BY

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Fire

On the major pattern of drainage and corresponding types of vegetation is the minor pattern reflecting the forest-fire history of the Clay Belt. Although our region is relatively rich in long undisturbed forest, MacLean and Bedell (1955) believe that most of it was burned at least once during the past 140 years. Their survey indicated that high fire frequency occurred at intervals of about 30 years with widespread fires "about 1820, between 1850 and 1865, about 1895, and in 1923." Moreover, there are relatively few natural barriers to the spread of a great fire in a dry season. The forest is therefore largely composed of even-aged stands dating from fires. The major and minor patterns show up clearly in the large-scale forest maps and air photos prepared for woodland operations.

Lightning is an important natural cause of fire in dry spells. Occasionally, old dead trees are found with their trunks scarred and with the branches of the living trees around them scorched (Plate XVII). With the advent of settlement, fires started by human agencies increased, and some of them were of disastrous proportions. The provincial fire protection services have plotted these fires, and their maps show that a very large proportion of the forest surrounding settlement suffered from man's carelessness. The older brûlés are now covered with second growth bush, chiefly poplar. Where there have been repeated fires, and particularly where fire has been followed by browsing of farm livestock, these secondary forests are remarkably poor in species. Trembling aspen predominates on the drier sites. It forms root shoots that may remain long in the ground. These may then be released by fire. Balsam poplar prevails on the wetter sites.

Climatic Factors

The interpretation of the long-term effects of climatic factors must await more knowledge of the sequence of events after the retreat of the ice-sheet and, in our region particularly, after the final drainage of glacial Lake Barlow-Ojibway. There are as yet no detailed studies in the Clay Belt on post-Pleistocene geology nor analyses of the fossil pollen record of peat bogs. Until this information is available we can only note that past fluctuations in climate should be taken into account in the interpretation of present conditions. Contemporary climatic conditions are summarized in Tables 1 to 4.

Local effects of exposure to wind and sun are apparent in certain places in our area. For example, wooded islands in larger lakes have more evergreen trees on the exposed side (northwest) and more deciduous trees on the protected quarter (Plate XIV). Exposed rocky hilltops, which occur but rarely, have stunted trees and barren slopes (Plate XII A).

Variety testing at the Experimental Farm, Kapuskasing (Wianeko in field husbandry, Coates in horticulture, 1953), shows the critical importance of the characteristic features of the weather of the Clay Belt. Winter kill, late spring and early autumn frosts, short season, and relatively high precipitation not only impose limits on the vegetation growing without cultivation but also have an important bearing on the future of agriculture and silviculture in our region. According to Thornthwaite (1931), "if

Consideration has been given by Halliday and Brown (1943) to the problem of the migration of certain tree species into our area. They have mapped the distribution of some of the most important trees of our region for both extent and density and have analysed the situation in view of Hultén's (1937) suggestions. Two of the four main forest biotas were available for migration into the Clay Belt following the drainage of glacial Lake Barlow-Ojibway. These two biotas are the eastern and the boreal. According to Hultén (1937) the eastern biota was centred on the Appalachian land-mass. It is represented in the Clay Belt flora by such trees as *Abies balsamea, Pinus Strobus, P. resinosa, P. Banksiana, Populus grandidentata, Betula lutea, Quercus* spp., and *Acer* spp. These trees are mainly characteristic of the Lake Timiskaming portion of our region. The boreal biota, on the other hand, is thought to have centred around the Bering Sea and spread eastward to the Atlantic Coast at least by the D-interglacial (Yarmouth) period. It probably survived the last glaciation in refugia along the Atlantic continental shelf, close to the southern limit of the ice front, and in the Yukon River valley (Map 1). Clay Belt representatives of this forest are *Picea glauca, P. mariana, Larix laricina, Populus tremuloides,* and *Betula papyrifera.* This group includes most of the chief trees of the Great Clay Belt. It should be remembered here that migration into our region would have been post-lacustrine rather than post-glacial (Raup, 1941). The geographical affinities of the whole Clay Belt flora are discussed in the concluding section of this memoir.

Windthrow

Windthrow is a considerable factor affecting the composition of the vegetation, which has probably not received the attention it deserves. In the drier forest we saw evidence of this factor naturally at work (Plate XII B) in the mixed deciduous-evergreen forest. In mature jack pine forest the knocking together and crashing of fallen trees in a windstorm can make a noisy camp and a restless night for field botanists. Around burned or cutover areas, windfall is apparent in all types of forest and is an important consideration in silviculture.

Climatic data for northern Ontario (Chapman, 1953) records wind speeds mostly from 6 to 10 m.p.h. in summer and 8 to 12 m.p.h. in winter; surpassing 30 m.p.h. infrequently and 40 m.p.h. rarely. Patches of blown-down trees date from the rare high wind speeds, sometimes in combination with rain, hail, or heavy snow or ice cover. Snowfall, hail, and thunder storms should also be considered here. The same source shows the Clay Belt in a zone of 80 to 100 inches average annual snowfall. Hailstorms are reported 0.3 to 2.8 times per year, and thunderstorms about 15 times a year.

Other Biotic Factors

Certain biotic factors, in addition to those discussed previously under Competition, are of considerable importance in the Clay Belt. With the exception of human settlement and plant diseases (which will be treated in the following sections), the work of beavers in damming water courses is possibly the most important. In this flat country the

BellR. = Bell River. About lat. 49° 43′ N., long. 77° 34′ W.

Turning southward on the canoe trip we collected along four portages around Inlet, Channel, Cold Springs, and Island Rapids, whence we paddled up the Bell River to the forestry station and road terminus at Kiask Chute. July 6 to 7, 1954. 4 localities.

ONTARIO: Timiskaming District

LL. = Larder Lake. Lat. 48° 06′ N., long. 79° 42′ W.

A camp was made 3 miles east of the townsite in McVittie Twp. between Bear and Tournene lakes, where most of the collecting was done. Collections were also made near Grassy Lake, 6 miles west, and in Gauthier Twp., 8 miles west of Larder Lake townsite. June 19 to 22, and July 11, 1952. 11 localities.

Math. = Matheson. Lat. 48° 32′ N., long. 80° 28′ W.

The townsite lies in Cochrane District close to the southern boundary and is the nearest good reference point for these localities. Collecting was done near Sylvia Falls, 16 miles south of the town in McEvoy Twp. July 13 and 16, 1952. 5 localities.

Tim. = Timmins. Lat. 48° 28′ N., long. 81° 20′ W.

This townsite is also in Cochrane District close to the southern boundary. We collected about 12 miles southwest, around Kenogamissi Lake in Thorneloe Twp. Next year we continued into Denton Twp., 16 miles southwest of the town and by another road 8 to 12 miles south into Adams Twp. August 15, 1952; June 11 and 17, 1953. 7 localities.

ONTARIO: Sudbury District

Gog. = Gogama. About lat. 47° 41′ N., long. 81° 44′ W.

A forestry station and air base is located on Minisinakwa Lake. Collections were made within a 13-mile radius of this base. July 23 to 26. August 2, 1954. 10 localities.

ONTARIO: Algoma District

LKap. = Kapuskasing Lake. Lat. 48° 32′ N., long. 82° 55′ W.

A forestry station is located near the railway station of Elsas at the north end of this lake, which we reached by the Canadian National Railways' main transcontinental line. Collections were made in the vicinity of Elsas, west to Agate Bay and 6 miles further to Mount Horden; south around Kapuskasing Lake and east along the Nemegosenda River. July 27 to 31, 1954. 6 localities.

ONTARIO: Cochrane District

Math. = Matheson, *see* above. Lat. 48° 32′ N., long. 80° 28′ W.

Large collections were made around two small lakes: McMillan, 3 miles south; and Pike, 5 miles south of the town. Excursions extended from the townsite on the banks of the Black River about 30 miles east to Ghost Mt. in Lamplugh Twp. past Leach Lake, Perry Lake, and through

habitat are lacking. Probably at or near its northern limit of range in our region.

Carex projecta Mackenz.

OttR. clearing around old camp, No. 5864, and ashwoods on low lake shore, No. 5834; VdO. lake shore, No. 3034; LWas. grassy clearing in aspen poplar–black spruce forest, old campsite, No. 5774; LMat. aspen poplar woods, No. 5794; Amos, gravel pit in poplar woods, No. 2997, and trail through white spruce woods on lake shore (in late anthesis June 28, 1952), No. 2871; LAO. sandy beach, No. 5126, aspen poplar woods, No. 5081, and grassy clearing on river shore, No. 5085; LL. roadside clearing, No. 2726, and clearing on lake shore, No 2797; Gog. grassy bank on lake shore (fruit mature July 25, 1954), No. 6001.

Although it was sometimes confused in the field with other similar species in the section *Ovales*, it is evident from the above series that this species is common throughout the Clay Belt on shores, low woods, and spreading into grassy clearings. Growing vigorously up to the northern margin of our region, this species probably extends northward, although there are no reports north of the Clay Belt.

Carex Crawfordii Fern.

NL. roadside through dwarf birch thicket (fruit mature July 27, 1953), No. 5305; Tas. gravelly clearing in jack pine forest (somewhat depauperate), No. 5403; Amos. open ditch to bog, No. 2992; LL. on clay, roadside clearing (in anthesis June 19, 1952), No. 2724.

Common throughout our region on shores and in meadows and clearings.

OttR. ashwoods on low lake shore, No. 5837, and trail through black spruce forest, No. 5858; VdO. clearing on river-bank, No. 3072; Amos. sandy bank above silted lake shore, No. 5403; Tim. clearing on lake shore, No. 4030.

These specimens are stouter throughout with greener spikelets and densely crowded heads and belong to var. *vigens* Fern. They closely match specimens so named by Fernald (1902) and also those of Taylor, Hosie, *et al.* from the north shore of L. Superior.

Carex Bebbii Olney

LAO. grassy clearing on river shore, No. 5083; Coch. ditch in railway yards, No. 3407; Math. road through poplar-spruce woods, No. 3204, and shore of small lake, No. 3230; Hst. path along river-bank (mature August 3, 1952), No. 3751, and river shore, No. 3844; Kap. shore of small lake, No. 3473.

Common on shores and spreading to wet sandy clearings.

Carex tenera Dew.

Amos, trail through white spruce woods, No. 2923, and clearing in white spruce woods, No. 2956; LTO. lakeshore cedar woods (spikelets small but apparently mature July 21, 1953), No. 5217; Kap. open, rocky hilltop, No. 4886, and river-bank near the town, No. 3362.

ARISTOLOCHACEAE

Asarum canadense L.

LTO. rich woods, elm-ash, No. 2528, and elm-ash woods with *Pteretis pensylvanica* and *Viola pensylvanica* var. *leiocarpa* (in flower May 27. 1954), No. 5574; NL. poplar-spruce woods in a deep clay ravine, No. 5311.

Found only in the richest woods of the Little Clay Belt. Not reported northward.

POLYGONACEAE

Rumex mexicanus Meisn.

Amos, clay creek-bank, No. 5424; LaS. sandy waste land around town dump (in anthesis July 17, 1954), No. 5895; LAO. wet rivershore clearing. No. 5090; Math. clearing on river-bank, No. 3193; Hst. old lumber camp. wet ground, No. 3838.

Occasional on wet clearings and river-banks, and in waste places.

Rumex fenestratus Greene

R. occidentalis, New B. & B.

Dup. lake shore (fruit nearly ripe August 20, 1952), No. 4114.

Found only once on a lake shore remote from settlement.

Rumex orbiculatus Gray

Tas. alluvial river shore (fruit mature August 29, 1952), No. 4305.

Collected only once on a wide stretch of alluvial shore on the Lois R. and apparently rare in the Clay Belt. Not reported northward.

Rumex crispus L. Curled Dock

LaS. floating margin of cat-tail marsh, No. 5883; LAO. wet rivershore clearing (in anthesis July 13, 1953), No. 5094; Coch. mucky shore of small lake (fruit halfgrown August 13, 1952), No. 3969; Hst. old lumber camp. wet ground, No 3839.

Occasional on wet clearings, shores, and in marshes. Not frequent enough to be a bad weed in our area. Not reported northward.

Rumex obtusifolius L. has been reported at Batchawana on L. Superior by Taylor. It is possible that this European bitter dock may also be naturalized within the Clay Belt.

Rumex maritimus L.

Collected in Tisdale Twp. near Timmins; wet sand, lake shore, F. N. Cowell, July 30, 1955.

This is the only Clay Belt collection of this species. Reported northward on James B. by DLD. Our material is var. *fueginus* (Phil.) Dusen.

Rumex Acetosella L. Sheep Sorrel

VM. clearing in red pine woods, No. 4713; NL. trail through jack pine forest (in anthesis June 14, 1952), No. 2600; LWas. grassy field on sand, No. 5728; Tas. sandy roadside through jack pine forest, No. 4272; Tim. aspen poplar–spruce woods, No. 4852.

Athyrium thelypterioides (Michx.) Desv. was also collected only at Batchawana (Taylor) on the north shore of L. Superior and may possibly occur within the southern margin of the Clay Belt.

Athyrium Filix-femina (L.) Roth

NL. young birch-poplar woods on wet limestone, No. 2468; VdO. alder–aspen poplar woods, lake shore, No. 5509; Kap. old white spruce forest (shedding spores July 24, 1952), No. 4604.

These three specimens represent a series of a dozen collections of this most variable and cosmopolitan species. Gray's Man. notes that var. *Michauxii* (Spreng.) Farw. is our most intricate variety and that it passes insensibly into many forms. These, according to the New B. & B., are mostly ecological variations.

Frequent in woods throughout the Clay Belt. Locally abundant in wet openings and alder thickets.

Asplenium viride Huds. has been collected on L. Superior at Michipicoten by Hosie, Harrison & Hughes, No. 995. The range of this species may extend northward within the southern margin of the Clay Belt. Similarly *A. Trichomanes* L. is another possibility, having been collected by the same party at Michipicoten, No. 991.

Pellaea glabella Mett. (*P. atropurpurea* var. *Bushii,* New B. & B.) has been reported from Batchawana (Taylor) and may turn up northward in the Clay Belt.

Cryptogramma Stelleri (Gmel.) Prantl was collected at all the Taylor and Hosie camps on L. Superior. The nearest station to the Clay Belt was Black R. near Schreiber; Hosie, Losee & Bannan, No. 41. There are rocks on Long L. (Precambrian) and L. Timiskaming (including Palæozoic limestones), which would provide a suitable habitat for this fern within our region. It was collected beyond the northern margin of our area at Smoky Falls, north of Kapuskasing, by Hustich, No. 1182.

Adiantum pedatum L. has been reported at Batchawana (Taylor), and there is a possibility that this species may also be found within the southern margin of the Clay Belt.

Pteridium aquilinum (L.) Kuhn

Kap. sandy roadside (sporangia mature July 24, 1952), No. 3484; Hst. sandy roadside through black spruce forest, No. 3853; Long. on sand, jack pine forest, No. 3690.

This material has the glabrous indusia and moderately pubescent leaf segments of var. *latiusculum* (Desv.) Underw.

Frequent in sandy jack pine forest and dry, rocky woods, becoming common on sandy openings and particularly roadsides.

Amos, on sand in jack pine forest, No. 2916.

This specimen has the pubescent leaf segments, with blade not ternate, of var. *pubescens* Underw. It may possibly be only a pubescent extreme of var. *latiusculum* which closely simulates this variety according to Gray's Man.

Only one somewhat doubtful collection of var. *pubescens*.

A frequent weed of impoverished or neglected sandy fields. It is common in open dry woods and clearings, and locally abundant in sandy jack pine woods. Sheep sorrel is listed by Potter (1934) northward on James B. near Rupert House.

Polygonum erectum L. was collected on L. Superior at Schreiber, Hosie, Losee & Bannan, No. 1814 (distributed as *P. aviculare* var. *vegetum* and revised by J. F. Brenckle). This species probably will be found in the nearby Clay Belt as a weed in waste ground.

Polygonum achoreum Blake

LTQ. clay ditch through lakeshore ash woods, No. 5270; VM. sandy roadside through clearing, No. 5919; Math. road embankment at bridge (in flower July 17, 1952), No. 3259.

A common weed of clearings and roadsides. The New B. & B. notes that this is "apparently an introduced species but of unknown origin."

POLYGONUM AVICULARE L.

VM. sandy roadside through clearings, No. 5918; Math. road embankment at bridge (in flower July 17, 1952), No. 3260.

This semicosmopolitan weed is treated in the New B. & B. as a single polymorphic species for the present.

Common on open waste land around settlements and along roadsides in our area.

Polygonum Douglasii Greene was also collected at Schreiber by Hosie, Losee & Bannan, No. 1827. Like *P. erectum* it may be expected in the nearby Clay Belt.

The range of *Polygonum viviparum* L. extends south of our region to the north shore of L. Superior. It should be kept on the list of species possibly occurring within the Clay Belt since it has been collected as close to our area as Schreiber, Hosie, Losee & Bannan, No. 1836. We searched for it wherever there was suitable habitat in the Clay Belt but without success.

Polygonum amphibium L.

P. natans, New B. &. B.

Tim. shore of small lake, No. 4057; LKap. on sandy beach, No. 6054; Kap. on wet shore, No. 3507.

These terrestrial forms, having flanged margins of new ocreae, are placed with var. *stipulaceum* (Coleman) Fern. in the treatment of Gray's Man.

Amos, open marsh, 25 yards from sluggish stream, No. 5458.

This specimen has no herbaceous flange on the margins of new ocreae and represents var. *stipulaceum* forma *simile* Fern.

NL. muddy river (in anthesis July 29, 1953), No. 5346; LAO. marshy river outlet, No. 5157; Kap. floating in shallow water of river, No. 3504.

These aquatic forms belong in var. *stipulaceum* forma *fluitans* (Eat.) Fern.

The variety and its forms occur occasionally in our region in various aquatic and shoreline marshy habitats.

Polygonum lapathifolium L. Pale Smartweed

LTQ. ditch through lakeshore ashwoods, No. 5271; VdO. clearing on river shore, No. 4577; Amos, sandy bank above silted lake shore, No. 5401, and mud flats around shallow lakes, Nos. 5487 and 5488; LaS. sandy waste land around town dump, No. 5906; Dup. lake shore, silted bay, No. 4117, and abandoned field, Nos. 4185 and 4188; Coch. lake shore, No. 3940; Math. waste land, No. 3295; Kap. town park and river shore (fruit mature July 26, 1952), No. 3490.

This material varies exceedingly in the colour of the spikes, the branching of the inflorescence, the number of glands on the axis, the size of the achenes, and in the persistence of tomentum on the undersides of the leaves. In No. 3940, for example, the axis is copiously glandular suggesting P. SCABRUM Moench of Gray's Man. In No. 3295 the axis is least glandular, and the undersides of the leaves are persistently tomentose, suggesting *P. lapathifolium* var. *salicifolium* Sibth. And No. 5401 has leaves green on both surfaces, suggesting the typical variety of Gray's Man. These variations were frequently observed side by side. It seems best to leave the whole series under *P. lapathifolium* as in the treatment of the New B. & B.

Frequent throughout the Clay Belt on muddy shores and clearings, and a common weed of waste land and old fields.

Polygonum Hydropiper L.

LTO. lake shore, ashwoods, No. 4649; Amos, mud flats around shallow lake (in flower August 15, 1953), No. 5489; Dup. clearing on lake shore, No. 4194.

Scarce, on wet shores and clearings. Not reported northward. Noted in Gray's Man. as either indigenous or adventive, and in the New B. & B. as a naturalized native of Europe.

POLYGONUM PERSICARIA L. Lady's-thumb

Tim. vacant town lot (in fruit August 19, 1952), No. 4635.

Collected only once in Timmins, this weed is apparently scarce in the Clay Belt, although it may have been overlooked in mistake for the similar and common *P. lapathifolium*. Not reported northward.

Polygonum sagittatum L. has been reported at Batchawana by Taylor (1938) and collected westward along L. Superior in Sibley Twp. by Taylor, Losee & Bannan, No. 756. This species also may possibly occur within the Clay Belt.

Polygonum cilinode Michx. Fringed Bindweed

NL. sandy roadside through jack pine forest, No. 2629; OttR. gravelly roadside through black spruce forest, No. 5839; Kap. gravel pit (in flower and fruit July 24, 1952), No. 3481.

Frequent throughout the Clay Belt in sandy jack pine forest, rock outcrops, roadsides, and dry clearings. Not found interfering with field crops although weedy in clearings and openings in the forest.

POLYGONUM CONVOLVULUS L. Wild Buckwheat

VM. sandy clearing in birch woods, former pinery, No. 5941; Dup. abandoned field, No. 4186; Coch. waste land (in flower and fruit July 19, 1952), No. 3398.

Occasional as a weed in fields, waste land, and clearings in the forest. It is not common enough to rate as a bad weed in our region. Reported northward on James B. by J. M. Macoun (1897).

FAGOPYRUM SAGITTATUM Gilib. Buckwheat

F. esculentum, New B. & B.

Dup. old field (in flower and fruit August 23, 1952), No. 4199.

Cultivated on a very minor scale in our region with 150 acres of crop reported in the Ontario portion of the Clay Belt in 1954. Rarely spreading after cultivation and persisting in old fields. Not reported northward.

FAGOPYRUM TATARICUM (L.) Gaertn. Tartary Buckwheat

Dup. abandoned field (in fruit August 22, 1952), No. 4184.

Rarely persistent in old fields which had evidently been planted in buckwheat. Not reported north of our area.

Polygonella articulata (L.) Meisn.

Tas. sandy roadside through jack pine forest (in flower with young fruits August 29, 1952), No. 4271.

There is another collection from the northern Quebec portion of the Clay Belt at La Ferme (near Amos) by H. Latendresse, August 10, 1952.

This species is apparently rare in the Clay Belt although locally abundant where we collected it.

CHENOPODIACEAE

The local and scattered adventive, CHENOPODIUM POLYSPERMUM L. was reported at Batchawana on L. Superior by Taylor (1938) and may possibly turn up in the Clay Belt.

Chenopodium hybridum L. Maple-leaved Goosefoot

VM. sandy clearing in birch woods, former pinery (in anthesis July 19, 1954), No. 5928; LTQ. lakeshore ditch through ashwoods, No. 5269, and rocky lake shore (in fruit September 10, 1952), No. 4426.

Occasional on rocky shores and clearings in the L. Timiskaming portion of the Clay Belt but not seen northward, nor reported northward beyond our region. Our material is the North American var. *gigantespermum* (Aellen) Rouleau.

CHENOPODIUM ALBUM L. Lamb's Quarters

LAO. rocky islets, cormorants and gulls nesting places (in anthesis July 1953), No. 5120; Coch. roadside at marshy lake shore, No. 3890.

A common weed of cultivated land throughout the Clay Belt and extending into clearings and openings far from settlement and northward beyond our area.

CHENOPODIUM GLAUCUM L. Oak-leaved Goosefoot

Coch. railway yards (in flower and fruit August 11, 1952), No. 3911.

Also found in the Quebec portion of the Clay Belt at Nord-Témiscamingue (now Notre-Dame-du-Nord) by Victorin, Germain & Meilleur, No. 44,694.

A rare weed of waste places in our region. Not reported northward.

Chenopodium capitatum (L.) Aschers. Strawberry Blite

LTO. gravel pit, lake shore (in anthesis May 27, 1954), No. 5569.

Rare, seen only once as a weed in the L. Timiskaming portion of the Clay Belt. Reported north of our area along the Albany and Attawapiskat rivers, by DLD.

Atriplex patula L.

Hst. vacant town lot (in fruit August 5, 1952), No. 3818.

This specimen has the mostly entire, non-hastate leaves of the typical variety.

Coch. railway yards (in anthesis July 19, 1952), No. 3402; Kap. roadside ditch through wet clearing, No. 3412.

These specimens have broadly triangular hastate leaves, some dentate, of the var. *hastata* (L.) Gray; No. 3402 being somewhat intermediate between the typical and the confluent variety.

This species was found occasionally in our area occurring like a weed in waste places.

Axyris amaranthoides L. Russian Pigweed

Coch. railway yards, No. 3913; Long. railway embankment (in anthesis July 29, 1952), No. 3590.

Occasional as a weed in waste places and particularly along railways. Not reported northward.

Corispermum hyssopifolium L.

Tas. railroad ballast (in fruit August 31, 1952), No. 4320.

A rare weed in the Clay Belt, adventive along railroads. Not reported northward.

Salsola Kali L. Russian Thistle

NL. railway yards in town (in anthesis July 29, 1953), No. 5356; Long. railway embankment, No. 3583.

An occasional weed along railway tracks. Not reported north of the Clay Belt. Our material is var. tenuifolia Tausch.

AMARANTHACEAE

Amaranthus retroflexus L. Red-root Pigweed

Dup. old field, No. 4204; Coch. railway yards (in late anthesis August 11, 1952), No. 3910.

A common weed in gardens, neglected fields, and on waste ground. Not reported north of our region.

AMARANTHUS ALBUS L. Tumbleweed

NL. railway yards in town, No. 5354; Coch. railway yards (fruit immature August 11, 1952), No. 3909.

An occasional weed along railway tracks. Not reported northward.

PORTULACACEAE

PORTULACA OLERACEA L. Purslane

LTQ. open rocky shore (capsules split and dropping seeds September 11, 1952), No. 4474.

Seen only once in the L. Timiskaming portion of the Clay Belt where this weed probably reaches its northern limit for this longitude.

CARYOPHYLLACEAE

SPERGULA ARVENSIS L. Corn Spurry

Amos, railway yards in town (in flower and fruit August 16, 1953), No. 5500.

A rare weed in our area. Not reported northward.

The Clay Belt lies within the range of *Sagina nodosa* (L.) Fenzl, which has been collected southward many times along the north shore of L. Superior. The nearest collection is from Flint B., near Schreiber; Hosie, Losee & Bannan, No. 596. Although there is little suitable habitat available, this species may turn up within our region.

Arenaria lateriflora L.

Kap. ravine, white spruce forest (in flower July 5, 1953), No. 5014.

Found only once in the Clay Belt.

Two more species of *Arenaria* may be expected within our region since they occur nearby. *A. macrophylla* Hook. was collected on L. Superior on the Slate Is., near Schreiber, Hosie, Losee & Bannan, No. 608 *A. dawsonensis* Britt., which is treated as a subspecies of *A. stricta* in the New B. & B., has been collected a little west of our area at L. Nipigon, John Macoun, July 8, 1884; and eastward at L. Mistassini, J. M. Macoun, July 29, 1885 (both specimens det. A. E. Porsild. distributed as *A. Michauxii* Hook.).

STELLARIA MEDIA (L.) Cyrillo Common Chickweed

NL. around farm buildings, No. 5334; LaS. highway ditch through sedge marsh, No. 2830, and sandy waste land around town dump (in flower July 17, 1954), No. 5889.

A garden weed throughout the Clay Belt, occasionally locally abundant on waste land. Listed by Potter (1934) northward on James B. at Rupert House.

STELLARIA GRAMINEA L. Grass-leaved Stitchwort

OttR. wood yard, No. 5838; LaS. highway ditch through a sedge marsh (first flowers in anthesis June 27, 1952), No. 2831; LAO. grassy clearing on river shore, No. 5086; IF. willow-alder thicket, clay shore, No. 5042.

Occasional in open wet clearings.

Stellaria longifolia Muhl.

NL. drainage ditch through bog (first flowers in anthesis June 14, 1952), No. 2573 (det. A. E. Porsild); Dup. silted margin of shallow lake, No. 4226; Tim. old black spruce forest, No. 4834; Kap. winter road through old black spruce forest, No. 4959.

Occasional throughout the Clay Belt in openings in the wet black spruce forest, on shores, wet clearings, and ditches.

B. Boivin has described *Stellaria atrata* (J. W. Moore) Boivin var. *eciliata* Boivin (Sv. Bot. Tidskr. 47: 1, p. 43, 1953), which was collected within the Clay Belt at Timmins, Bassett & Bragg, No. 1251 (DAO).

Stellaria calycantha (Ledeb.) Bong.

NL. ditch below rocky outcrop (in flower June 17, 1952), No. 2671; LL. clearing on lake shore, No. 2800; Kap. ditch in old white spruce forest. No. 4605.

Frequent in moist openings in the forest, stream-banks, shores, wet clearings, and ditches.

Cerastium vulgatum L. Common Mouse-ear Chickweed

VM. sandy trail through white spruce – aspen poplar forest (first flowers in anthesis June 8, 1953), No. 4722; Amos, farm field, No. 5677; Kap. winter road through old black spruce forest, No. 4960.

A common weed in fields and gardens, extending far into the forest along roads, into clearings, and northward beyond our region.

Two more species of *Cerastium* of possible occurrence within our region should be noted although not collected by us. *C. arvense* L. has been collected at the western end of L. Superior on Silver Islet by Taylor, Losee & Bannan, No. 478; and northward on James B. at Fort George by Baldwin, Hustich, Kucyniak & Tuomikoski, No. 674. *C. nutans* Raf. has been collected close to the western end of the Clay Belt at Nipigon by John Macoun, June 23, 1884.

Lychnis alba Mill White Cockle

LaS. roadside through marsh (in flower June 27, 1952), No. 2833; Dup. clearing in black spruce forest, No. 4157.

A rare weed of roadsides and clearings in the Clay Belt. Not reported northward.

Silene Cucubalus Wibel Bladder Campion

NL. roadside through farmland, No. 5196; Math. clearing around old camp (in flower July 13, 1952), No. 3160.

Occasional as a weed of roadsides and clearings, more frequent in the farmlands of the L. Timiskaming portion of the Clay Belt. Reported northward at Albany by DLD.

Silene antirrhina L. has been reported from Batchawana on L. Superior by Taylor (1938). The range of this species may possibly extend to the southern margin of our region.

SILENE NOCTIFLORA L. Night-flowering Catchfly

VM. birch-maple woods on lake shore, No. 5948; Math. roadside ditch (in flower and fruit July 16, 1952), No. 3209; Kap. gravel pit, No. 3483.

Occasional throughout our region as a weed of clearings and roadsides. Collected northward on James B. at Rupert House by J. M. Macoun, Sept. 4, 1885.

SAPONARIA VACCARIA L. Cow Cockle

Vaccaria segetalis, New B. & B.

NL. railway yards in town (in flower July 29, 1953), No. 5353.

A rare weed seen only in the Little Clay Belt where it probably reaches its northern limit for this longitude.

DIANTHUS BARBATUS L.

LAO. lakeshore clearing (in flower July 12, 1953), No. 6057.

Rarely escaping or planted but seen around old camps where the material we collected had persisted for many years after abandonment. Not reported northward.

DIANTHUS DELTOIDES L.

LTQ. open rocky lake shore, Nos. 4470 and 5262 (in flower July 24, 1953).

Found only on L. Timiskaming where it has persisted long after introduction at a summer cottage and spread along the open rocky lake shore. Not seen northward.

CERATOPHYLLACEAE

Ceratophyllum demersum L.

Tim. small sandy lake, close to shore thickets, No. 4059; Coch. in 4 feet of water, Lillabelle L., No. 6156.

Found only in two lakes and apparently rare, although it may have been overlooked among other similar aquatics. Not reported northward.

NYMPHAEACEAE

Nuphar microphyllum (Pers.) Fern.

Dup. shallow water (in fruit August 25, 1952), No. 4239; Coch. small lake, 1 foot of water, muddy bottom (in flower July 19, 1953), No. 5181; Tim. shallow water, No. 4046; Ger. sheltered rocky bay, No. 6148.

Frequent in small lakes and quiet bays in the northern portion of the Clay Belt but not observed in the L. Timiskaming region. Often occurring (Nos. 4046 and 4239) together with *N. variegatum* and the hybrid *N. rubrodiscum*. Not reported north of our region.

X Nuphar rubrodiscum Morong

Amos, water 1 foot deep, sandy bottom, No. 4572; Dup. shallow water, No. 4209; LAO. marshy river outlet (in flower July 16, 1953), No. 5153; Tim. shallow water, No. 4038; LKap. 6 feet of water in marshy backwater, No. 6078.

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Occasional in small lakes and quiet bays in the northern portion of the Clay Belt but not seen in the L. Timiskaming region. With Nos. 4038 and 4209, the parental species *N. microphyllum* and *N. variegatum* were found in the same lakes. This hybrid and one of its parents, *N. microphyllum*, have not been reported north of our region.

Nuphar variegatum Engelm.

Sen. in small lake (in fruit September 6, 1952), No. 4390; Dup. shallow water, No. 4240; LAO. marshy river outlet (in flower July 16, 1953), No. 5138; Tim. shallow water, No. 4039.

Abundant throughout the Clay Belt in small lakes, sluggish streams, and quiet bays. Occurring together (Nos. 4039 and 4240) with *N. microphyllum* and the hybrid *N. rubrodiscum* in the northern portion of our area.

Nymphaea odorata Ait.

LTO. shallow clear lake, 4 feet of water (in flower July 31, 1953), No. 5379; Kap. small lake surrounded by sedge marsh, No. 6123.

Rare, found only in two widely distant lakes in the Clay Belt where this species reaches its northern limit for these longitudes.

Nymphaea tuberosa Paine has been reported at Batchawana on L. Superior by Taylor and may possibly occur within the southern margin of the Clay Belt.

Nymphaea tetragona Georgi

Tas. slow-moving stream at inlet to lake, No. 4260; Coch. small lake, off sedge marsh, No. 6166; Tim. marshy backwater of river (in fruit August 16, 1952), No. 4024; LKap. in 15 inches of water, marshy backwater (in flower July 29, 1954), No. 6075; Long. backwater of river, No. 3600.

Occasional in sluggish streams, small marshy lakes, and backwaters in the northern portion of the Clay Belt, and locally abundant in the vicinity of Long L. at the western end of our area. Rare elsewhere, this species occurs generally in the north portion of our area and is abundant at Longlac. Reported northward at Albany on the west side of James B. by DLD. Our material is ssp. *Leibergi* (Morong) Porsild.

Brasenia Schreberi Gmel.

Math. floating off boggy lake shore, No. 3102, and in same lake off *Chamaedaphne-Andromeda* bog, No. 5534; Tim. in small boggy lake (in flower August 15, 1952), No. 4007.

Rare, found only in two small boggy lakes and not reported northward.

RANUNCULACEAE

Ranunculus trichophyllus Chaix.

Dup. shallow silted bay of lake (in flower and fruit August 24, 1952), No. 4207, and shallow bay, No. 4214; Kap. silted bay of river, No. 3516, and meandering creek, No. 6105.

These specimens have leaves with adnate tapering stipules and definite petioles, which separate this species from *R. subrigidus*. The thicker stems

and larger dimensions throughout place them with the typical variety in the treatment of Gray's Man. (*R. aquatilis* var. *capillaceus,* New B. & B.).

Scarce in the Clay Belt, in shallow water of rivers and lakes.

VdO. cold shallow stream, No. 5521; Amos, stranded on muddy lake shore (in flower August 14, 1953), No. 5479, and mud flats around shallow lake, No. 3861; Hst. in water of marshy ditch, No. 3849, and Nagagami R. near bank, No. 3710; Kap. shallow bay of river, No. 3384.

These collections have the very delicate stems and smaller dimensions throughout of var. *eradicatus* (Laestad.) W. B. Drew (*R. aquatilis* var. *eradicatus* New B. & B.).

The variety occurs occasionally in shallow water and muddy shores of rivers, small lakes, and ditches.

Ranunculus subrigidus W. B. Drew

See under *R. circinatus* in New B. & B.

VM. 6 feet of water off high rocky shore, No. 5955; Dup. marshy backwater of river, No. 4168; Math. shallow muddy water (in flower and fruit July 17, 1952), No. 3252; LKap. marshy bay, No. 6041.

This material is intermediate in character between *R. trichophyllus* and *R. longirostris* Godr., having firm, subsessile leaves with dilated stipules like the latter and short-beaked achenes like the former. The average number of achenes is closer to the 16 of *R. longirostris* than the 30 of *R. subrigidus,* and they are referred to this species with some hesitation.

Occasional in small lakes and marshy bogs.

Ranunculus Purshii Richards.

R. Gmelini, New B. & B.; *R. Gmelini* var. *Hookeri,* Gray's Man.

Kap. mucky floor of lakeshore alder thicket, No. 4864, and marshy backwater of river (in flower and fruit August 5, 1954), No. 6108.

Rare, found only at two places on Remi L. near Kapuskasing.

Ranunculus lapponicus L.

LMat. boggy creek in black spruce forest, No. 5800; Coch. old, wet black spruce forest, No. 3919; Kap. sphagnum floor of black spruce forest (in flower June 26, 1953), No. 4906, and cedar woods on creek shore, No. 5001.

Scarce in the Clay Belt in wet black spruce forest and cedar woods.

Ranunculus reptans L.

R. Flammula var. *filiformis,* New B. & B.

NL. open alluvial shore of Elk L., No. 5303; Amos, sandy lake shore (in flower July 3, 1952), No. 2946; LAO. sandy, silted lake shore, No. 5139.

Occasional throughout the Clay Belt on open, wet, sandy, and silted shores.

Kap. winter road on Shanly Creek flood-plain (in flower July 1, 1953), No. 4977; Hst. silted shore, No. 3817.

These specimens have leaves with the well-developed blades of var. *ovalis* (Bigel) T. & G.

Found twice, and much less frequent than the typical variety with filiform leaves. Occurring on wet silted shores.

Ranunculus sceleratus L.

Tim. marshy shore of Porcupine L. (in fruit and flower August 16, 1952), No. 4031.

Found only once and apparently rare, although it may have been overlooked in mistake for similar species.

Ranunculus abortivus L.

LTQ. cedar woods on springy hillside, No. 4683; LTO. rich woods, elm-ash, No. 2529; Tas. bank of stream through boggy spruce forest, No. 5708; Arnt. wet ashwoods, No. 2776; Kap. margin of black spruce forest, alder thicket, No. 4903; Hst. river-bank thickets in cut-over poplar-spruce woods (first flowers in anthesis June 4, 1954), No. 5650.

All this material has the pubescent young peduncles of var. *acrolasius* Fern.

Occasional throughout the Clay Belt in damp woods, alder thickets, and banks of streams.

Ranunculus recurvatus Poir.

NL. clay bank of ravine, poplar-spruce woods (in flower June 14, 1952), No. 2585.

Rare, found only once in a wooded ravine in the Little Clay Belt where this species probably reaches its northern limit for this longitude.

Ranunculus pensylvanicus L. f.

OttR. clearing on river-bank, No. 5850; VdO. open gravelly lake shore, No. 5511; Amos, gravel pit in poplar woods (in flower and fruit July 4, 1952), No. 2996; LAO. lakeshore clearing, No. 5075; Math. roadside ditch through poplar woods, No. 3203; Hst. silted lake shore, No. 3813.

Common throughout the Clay Belt on open shores, wet openings in the forest, ditches, and clearings.

Ranunculus Macounii Britt.

LMat. aspen poplar woods (in flower July 4, 1954), No. 5795; Amos, clearing in white spruce woods, No. 2965; Tas. alluvial river shore, No. 4308; Kap. roadside ditch through wet clearing, No. 3410.

Occasional on alluvial shores, damp openings in the forest, and in ditches.

Ranunculus septentrionalis Poir.

NL. in thickets on sandy bank of river, No. 2537 (det. A. E. Porsild); Tas. bank of stream through boggy black spruce forest (first flowers in anthesis June 11, 1954), No. 5707; Dup. lake shore, silted bay, No. 4108 (det. A. E. Porsild); Tim. river shore at spring outlet, No. 4753.

Occasional throughout our region on silted shores, thickets, and stream-banks.

RANUNCULUS REPENS L. Creeping Buttercup

Amos, railway yards in town, No. 5498, and dry clay flats, shore of Harricanaw R., No. 5460; LMat. clearing in poplar woods (first flowers in anthesis July 4, 1954), No. 5804; Kap. grassy bank in town park on river shore, No. 3506.

Scarce in the Clay Belt occurring as a weed around towns and along wet shores and in clearings (No. 5804) far removed from settlement. Reported northward on the Harricanaw R. by Dutilly and Lepage (1952).

RANUNCULUS ACRIS L. Tall Buttercup

NL. roadside through poplar woods (first flowers June 11, 1952), No. 2452; OttR. lakeshore clearing around lumber camp, No. 5830; Tim. gravel-pit clearing in black spruce forest, No. 4816.

A common weed of neglected pastures throughout the farmlands of the Clay Belt. Together with ox-eye daisy (CHRYSANTHEMUM LEUCANTHEMUM) it does much to reduce the amount of available pasture since cattle avoid this weed. Occurring less frequently in clearings in the forest.

Thalictrum dioicum L.

LTO. clay creek-bank in elm – balsam poplar woods, Nos. 5573 (♀) and 6168 (anthers shedding pollen May 27, 1954), and rich woods, elm-ash, No. 2523; LL. roadside alder thicket (mature achenes dropping off July 11, 1952), No. 3090; Math. ravine, poplar woods, No. 3245.

Occasional in the Little Clay Belt, rare northward in our area but listed by Hustich (1955) on the Moose R. Occurring in moist deciduous woods and thickets.

Thalictrum confine Fern.

NL. roadside ditch through farmlands (achenes immature June 17, 1952), No. 2666; Coch. river-bank at rapids, No. 3963; Kap. rivershore thickets, No. 3305.

These specimens have four cauline leaves, thin broad leaflets, and long fruiting pedicels which match *T. confine* rather than the similar *T. venulosum*.

Collected at three widely distant points in the Clay Belt and apparently scarce, although it was not separated in the field from similar species. Listed at several stations in the southern region of James B. by Potter (1934).

Thalictrum venulosum Trel.

Math. ravine, poplar woods, No. 3244; Kap. rocky shelves at rapids (anthers already opened June 27, 1953), No. 4921 and banks of Kapuskasing R., No. 3327; Hst. clearing on river-bank, Nos. 3703 and 4665.

These specimens all have the generally smaller dimensions by which *T. venulosum* is scarcely distinguishable from *T. confine* according to the New B. & B.

Scarce in our region on open river-banks, clearings, and deciduous weeds.

Thalictrum dasycarpum Fisch. & Lall.

NL. clay-banked ravine, poplar-spruce woods (in anthesis June 17, 1952), No. 2688; Math. banks of Black R., creek outlet, Nos. 4589 and 4590.

This material is all pistillate, the sepals (in No. 2688) are acuminate and the stigmas (in Nos. 4589 and 4590) up to 3 mm. long. These specimens have therefore been referred to *T. dasycarpum* with some doubt, since staminate material is lacking. Reported northward at many stations in the James B. area by DLD.

Thalictrum polygamum Muhl.

LTO. shingle beach in front of cedar woods, No. 5228; VdO. clearing on lake shore, Nos. 3047 and 3048; LWas. alder thicket on sandy beach, No. 5765; Dup. lake shore, boulders and sand, No. 4150; Gog. rocky creek-bank, No. 6015; Kap. roadside through white spruce woods (in anthesis July 5, 1953), Nos. 5015 and 5016; Hst. lakeshore thickets, No. 3803.

This material has distinctly clavate filaments, which occur frequently with the carpels on predominantly pistillate flowers, placing it with this species.

Common on shores, thickets, openings, and clearings in the forest. Listed by Potter (1934) north of our area on the Moose R.

Hepatica americana (DC.) Ker

VM. clearing in red pine woods (fruit immature June 7, 1953), No. 4715; NL. cut-over pine woods on limestone ridge, No. 5193.

Scarce in the pine woods of the L. Timiskaming portion of the Clay Belt and collected northward near Timmins; poplar-birch-hazel forest; moist, rich humus over boulders, F. N. Cowell, May 29, 1955. Not reported north of our region.

Two species of *Anemone* have been collected close to the margins of the Clay Belt. Probably they will be found within our region, although suitable habitat is rare. *A. parviflora* Michx. has been collected on the Slate Is. in L. Superior, near Schreiber, by Hosie, Losee & Bannan, No. 1879. A specimen labelled *A. multifida* Poir. var. *hudsoniana* DC. forma *sanguinea* (Pursh) Fern. was collected by Dutilly & Lepage, No. 15,118, on the Harricanaw R. between lat. 48° 20′ and 51° N. This range of latitude straddles the northern margin of the Clay Belt.

Anemone riparia Fern.

LTQ. open rocky lake shore (ripe achenes dropping September 10, 1952), No. 4646; NL. young aspen woods, ravine, No. 5316; Kap. rocky river-bank, No. 4593.

Occasional in the L. Timiskaming portion of the Clay Belt, scarce northward. Occurring on open shores, river-banks, and in deciduous woods.

Anemone canadensis L.

NL. roadside ditch through farmlands (first flowers June 17, 1952), No. 2667; VM. grassy bank on rocky lake shore, No 5911; LaS. road culvert, No. 2884; Hst. lakeshore thickets, No. 3791.

Occasional on shores and thickets, common in clearings and on roadsides, forming large colonies.

Anemone quinquefolia L.

Tim. rivershore thickets beneath white spruce, No. 4754; Kap. old white spruce forest, No. 3464; Hst. grassy meadow in rivershore thicket (in anthesis June 2, 1954), No. 5629.

These specimens, and all other collections and observations, have the stems villous with spreading hairs below the inflorescence as in var. *interior* Fern.

Common in old forest and damp thickets. In the vicinity of Kapuskasing it is one of the most frequent forest plants in a wide amplitude of habitats from the well-drained sites of the mixed coniferous-deciduous woods to the poorly-drained black spruce flats. The range of this variety extends north beyond our region as far as Albany on James B. where it was reported by DLD.

Clematis virginiana L.

NL. clearing at bottom of ravine (in flower July 27, 1953), No. 5315.

Found only once in the Little Clay Belt where this species reaches its northern limit for this longitude.

Clematis verticillaris DC.

Hail. climbing over young balsam poplar, opening in pine woods (in flower May 30, 1954), No. 5621; VM. clearing in red pine woods, No. 4712; Arnt. twining on aspen poplar branch, talus slope, No. 2738; Hst. steep bank above lake, No. 3763.

Occasional in openings in the pine woods of the L. Timiskaming portion of the Clay Belt and less frequent northward in openings on dry wooded slopes.

Caltha palustris L.

NL. small creek through young aspen woods (in flower May 28, 1954), No. 5589); Tas. marshy creek outlet at lake, No. 5711; Tim. ditch in black spruce forest, No. 4805; Hst. grassy meadow in rivershore thickets, No. 5626.

Common along marshy creeks, in wet meadows, ditches, and wet clearings.

Coptis groenlandica (Oeder) Fern.

C. trifolia, New B. & B.

NL. damp sandy place in jack pine forest, No. 2594; Amos, young black spruce – birch woods (in flower June 8, 1954), No. 5657; Tim. young aspen poplar – jack pine woods, No. 4746.

Common throughout the forests of the Clay Belt in damp places.

Aquilegia canadensis L.

LTQ. open rocky lake shore, No. 4731; LTO. limestone ledges on cliff (in anthesis May 27, 1954), No. 5559; Kap. roadside clearing, No. 3386; Hst. clearing on river-bank, No. 3715.

Occasional on open rocky shores, cliffs, and river-banks, and in clearings. Not reported northward.

In the gardens of the Clay Belt, larkspur (DELPHINIUM spp.) is the hardy perennial par excellence. Growing conditions are evidently remarkably well suited to this beautiful garden plant. It was not found spreading or persisting without cultivation.

ACONITUM NAPELLUS L.

NL. abandoned farmstead, persistent after cultivation (in flower July 22, 1953), No. 5253.

Found once, long persisting and spreading a little, in what evidently was once the garden of an abandoned pioneer farm. Not reported northward.

Actaea rubra (Ait.) Willd.

NL. young birch-poplar woods on limestone ridge, No. 2478; Amos. young birch-poplar (in anthesis June 9, 1954), No. 5680; Math. road through poplar-spruce woods (in fruit July 16, 1952), No. 3208; Kap. opening in black spruce forest, No. 4895.

Occasional throughout the Clay Belt in rich deciduous woods and in openings in the spruce forest.

Math. road embankment at bridge (in fruit July 17, 1952), No. 3261; LKap. abandoned settlement, pin cherry thicket, No. 6096.

These specimens have the white fruit of forma *neglecta* (Gillman) Robins., which is much less frequent in our area than the red-fruited typical form.

Actaea pachypoda Ell.

VM. white spruce – birch woods (fruit immature July 20, 1954), No. 5962.

Rare, seen only once in the L. Timiskaming portion of the Clay Belt where this species reaches its northern limit for this longitude.

BERBERIDACEAE

Caulophyllum thalictroides (L.) Michx. was collected on L. Superior at Batchawana by Taylor, Hosie, Fitzpatrick, Losee & Leslie, No. 2461 (omitted in catalogue, 1938). It may occur northward within the southern margin of our region, possibly in the L. Timiskaming portion of the Clay Belt.

PAPAVERACEAE

Sanguinaria canadensis L.

This species has been collected once in the Clay Belt near Timmins; moist mixed poplar-spruce-balsam fir-birch forest, rich humus, F. N. Cowell, June 4, 1955. It is curious that it was not observed in the vicinity of L. Timiskaming along with other plants of the Great Lakes – St. Lawrence Forest Region. Cowell's collection at Timmins marks the northern limit of the range of this species for this longitude.

Adlumia fungosa (Ait.) Greene

Collected once at Haileybury: recent clearings, W. R. Watson, August 31, 1922. This collection is just inside the L. Timiskaming portion of the Clay Belt, which is the northern limit for this species in this longitude.

Corydalis sempervirens (L.) Pers.

Amos, shelves on rock knob (first flowers June 8, 1954), No. 5669; LAO. rocky islet, No. 5160; LL. open rocky outcrop, No. 2702; Math. sandy roadside through spruce forest, No. 4817.

Frequent on open rock outcrops, sandy pine woods, and roadsides.

Corydalis aurea Willd.

LTQ. roadside ditch through farmland (in flower and fruit June 8, 1953), No. 4735; LTO. gravel pit, No. 5566.

Rare, in dry clearings in the L. Timiskaming portion of the Clay Belt, and collected northward near Timmins; roadside, dry poplar woods, rich soil, F. N. Cowell, May 22, 1955. Not reported north of our region.

CRUCIFERAE

Several species of *Draba* have been collected on the north shore of L. Superior not far south of the Long L. area of the Clay Belt. Although there is little suitable habitat for these plants within our region, they should be kept on the list of plants which may yet be found. John Macoun collected *D. arabisans* Michx. at Schreiber, June 22, 1891; *D. lanceolata* Royle at Red Rock, June 27, 1884; and *D. nemoralis* L. var. *lejocarpa* Lindl. at Michipicoten, July 27, 1869. A specimen labelled *D. aurea* M. Vahl was collected in Sibley Twp. by Taylor, Losee & Bannan, No. 1017.

THLASPI ARVENSE L. Stinkweed

LaS. sandy waste land around town dump, No. 5896; Math. clearing around old camps, No. 3157; Kap. eroded clay river-bank (in flower and with immature fruits June 29, 1953), No. 4945.

A frequent weed of farm fields, waste places, often in forest camps far removed from settlement, and northward beyond our area.

LEPIDIUM CAMPESTRE (L). R. Br. Field Peppergrass

Long. railway embankment (in flower and with immature fruits July 29, 1952), No. 3581, and at Kenogami R. control dam, No. 3662.

An occasional weed of roadsides and waste ground. Not reported northward.

LEPIDIUM DENSIFLORUM Schrad.

VM. sandy clearing in birch woods, former pinery (in flower and fruit July 19, 1954), No. 5940; Coch. waste land, No. 3397; Long. railway embankment, Nos. 3585 and 3591.

A common weed of waste places in sandy and light soils. Occurring in forest clearings far from the main settlements and northward beyond our area. According to Frankton (1955) it is native to North America and is introduced elsewhere. The New B. & B. states that it is introduced in

Europe and on the Pacific Coast. For the range of Gray's Man. this weedy species is noted as probably adventive.

Subularia aquatica L.

Amos, silted sandy lake shore (in flower with immature fruits August 4, 1953), No. 5396.

Found only once in the Clay Belt in a season of low water in L. Beauchamp (L. St. Viateur) where it was locally abundant. Apparently rare, although it may have been often overlooked in shallow lakes.

Capsella Bursa-pastoris (L.) Medic. Shepherd's Purse

LTO. gravel pit, lake shore (fruit flowers May 27, 1954), No. 5568; Coch. roadside at lake shore, No. 3889.

A common weed of gardens, roadsides, and clearings throughout the Clay Belt and northward.

Neslia paniculata (L.) Desv. Ball Mustard

NL. railway yards, No. 5350; Dup. abandoned field, No. 4183; LaS. sandy waste land around town dump, No. 5904; Math. clearing around old camp (in flower with immature fruits July 13, 1952), No. 3154.

An occasional weed of fields, waste land, and clearings, sometimes locally abundant. Not reported northward.

Brassica hirta Moench White Mustard

Dup. old field (flowers and immature fruits August 23, 1952), No. 4666.

This very small specimen has the young siliques white-bristly and is thus distinguished from the frequent B. Kaber.

Collected only once and apparently rare in the Clay Belt. Not reported northward.

Brassica Kaber (DC.) L. C. Wheeler Wild Mustard

OttR. clearing at fire-ranger station (in flower, fruit immature July 13, 1954), No. 5855; Amos, railway yards (with nearly mature fruit August 16, 1953), No. 5497; Dup. old field, No. 4667; LaS. sandy waste land around town dump, No. 5890; Coch. waste land, No. 3399; Math. clearing around old camp, No. 3158; Long. at Kenogami R. control dam, No. 3664.

The specimens in this series with more mature fruits have only slightly torulose siliques and belong to the var. pinnatifida (Stokes) L. C. Wheeler in the treatment of Gray's Man.

A frequent weed in farmlands and waste land in the settled parts of the Clay Belt, and noted northward in the James B. area by DLD.

Kap. waste land at rocky falls, No. 3248.

In this specimen the siliques are slender and strongly torulose, placing it with var. Schkuhriana (Reichenb.) L. C. Wheeler, which, according to Gray's Man., is less common in the Manual range than var. pinnatifida.

Brassica juncea (L.) Coss.

Dup. old field (in flower with immature fruits August 23, 1952), No. 4200.

Collected only once in a very weedy field and apparently rare in the Clay Belt, although it may have been overlooked in mistake for the commoner mustards. Also collected at Macamic (between Taschereau and LaSarre, Quebec) by H. Groh, Sept. 7, 1938 (DAO); and northward on James B. at Rupert House by F. G. Spafford, No. 153 (DAO).

Brassica Rapa L. Bird Rape

B. campestris, New B. & B.

Dup. abandoned field (in flower and with fullgrown siliques August 22, 1952), No. 4182.

A rare weed in our area. DLD list this species northward at Albany on James B.

Brassica Napus L.

B. Rapa, New B. & B.

LTQ. waste ground near town (in flower with immature fruits June 9, 1953), No. 4740.

Turnips are grown commercially in the Clay Belt and are seen rarely on dumps of garden trash and abandoned fields, flowering in the second year after sowing.

Erucastrum gallicum (Willd.) O. E. Schulz Dog Mustard

Long, railway embankment (in flower with immature fruits July 29, 1952), No. 3582.

Found once at the railway divisional point at Longlac where this weed was probably introduced by the freight trains carrying grain from Western Canada. According to Frankton (1955), this European plant was first collected in Canada at Emerson, Manitoba, in 1922. Not reported northward.

Conringia orientalis (L.) Dumort. Hare's-ear Mustard

This weed has been collected twice in our area; at Cadillac (between Val d'Or and Arntfield, Quebec), clay soil by old gas station, Bragg & Bassett, No. 105 (DAO); and Kapuskasing railroad siding, E. G. Anderson, No. 1874 (DAO). Not reported northward.

Sisymbrium altissimum L. Tumbling Mustard

NL. railway yards, No. 5548; Long. railway embankment (in flower with immature fruits July 29, 1952), No. 3584.

An occasional railroad weed in our region. Not reported northward.

Descurainia Sophia (L.) Webb Flixweed

NL. railway yards, No. 5351; Math. waste land (in flower with immature fruit July 19, 1952), No. 3297; Long. waste land beside railroad, No. 3589.

An occasional weed of railroads and waste land and not reported north of our area.

Descurainia Richardsonii (Sweet) O. E. Schulz. Gray Tansy Mustard

Collected at Cobalt by Cléonique-Joseph, No. 10,946 (DAO, det. C. Frankton). This locality lies at the margin of the L. Timiskaming portion of the Clay Belt. This species has been reported northward at Moosonee, the railhead near James B., by DLD.

Erysimum cheiranthoides L. Wormseed Mustard

LTO. gravel pit, lake shore (in flower May 27, 1954), No. 5565; VM. sandy clearing in birch woods, former pinery, No. 5932; LaS. sandy waste land around town dump, Nos. 5892 and 5891; Coch. waste land, No. 3400; Math. clearing around old camp, No. 3153.

A common weed throughout our area on waste land, in fields and clearings often remote from settlements, and extending far northward. According to Frankton (1955) this plant was probably introduced from the Old World, although some botanists believe that at least part of the population may be native.

Erysimum inconspicuum (S. Wats.) MacM. has been collected at several stations on the north shore of L. Superior, the nearest being Schreiber, Hosie, Losee & Bannan, No. 685. This species may be expected within the Clay Belt as an adventive from the west or south.

Rorippa sylvestris (L.) Bess. Creeping Yellow Cress

Amos, around farm buildings (in flower with immature fruits August 16, 1953), No. 5502.

Found only once and apparently a rare weed in the Clay Belt. Not reported northward.

Rorippa islandica (Oeder) Borbás Yellow Cress

Amos, river shore (in fruit July 3, 1952), No. 2980.

This specimen has the glabrous foliage and cylindric fruit of var. *Fernaldiana* Butters & Abbe, which, according to Gray's Man., passes insensibly into var. *hispida*.

Collected only once and apparently much less frequent than var. *hispida*.

NL. roadside ditch through alder thicket, No. 5308; LWas. grassy field. No. 5726; Arnt. wet sand above river (first flowers June 21, 1952), No. 2769; LAO. rocky islets, No. 5114; LKap. creek-bank through marsh, Nos. 6080 and 6081; Hst. silted lake shore, No. 3814.

The series above have the hispid foliage and fruit shapes of var. *hispida* (Desv.) Butters & Abbe.

Frequent throughout the Clay Belt on shores, in marshy thickets, wet clearings, and ditches.

Barbarea vulgaris R. Br. Yellow Rocket

LTQ. ditch in clearing (in flower June 9, 1953), No. 4739; NL. clearing at lake shore, No. 2686; Hst. clearing on marshy shore, No. 3727.

Occasional in damp clearings in our area and noted northward at Moosonee by DLD.

Dup. foot of rock outcrop (fruit mature August 20, 1952), No. 4131. This specimen has the spreading pedicels and arcuate siliques of var. *arcuata* (Opiz) Fries.

Barbarea orthoceras Ledeb.

VdO. sandy lake shore (in fruit July 8, 1952), No. 3043.

Rare, found only once in the eastern portion of the Clay Belt.

Dentaria diphylla Michx.

NL. white spruce-mixed woods in deep clay ravine (in flower May 29, 1954), No. 5610.

Rare, found only in the Little Clay Belt where this species reaches its northern limit.

The two indigenous varieties of *Cardamine pratensis* L. have been collected in calcareous regions not far from the Clay Belt and may possibly be found within our area. The var. *palustris* Wimm. & Grab. was collected at Moosonee by Baldwin, No. 1468; and the var. *angustifolia* Hook. at L. Mistassini by J. M. Macoun, July 13, 1855 (both varietal determinations by H. J. Scoggan).

Cardamine pensylvanica Muhl.

VM. sandy clearing in birch woods, former pinery, No. 5923; LMat. boggy creek in black spruce forest, No. 5797; LL. wet ashwoods (in flower with immature fruits June 19, 1952), No. 2730; Coch. marshy lake shore, No. 3907; Kap. alder thicket around beaver pond, No. 4898.

Frequent throughout our region in a wide variety of wet habitats from marshy shores, boggy creeks, wet thickets, and low woods, to clearings.

Cardamine parviflora L. var. *arenicola* (Britt.) O. E. Schulz has been collected on L. Superior as close as Schreiber; Hosie, Losee & Bannan, Nos. 659 and 660 (varietal determination by H. J. Scoggan). This species will probably be found northward within the margin of the nearby Clay Belt.

Arabis lyrata L. has been collected many times along the north shore of L. Superior and perhaps will turn up within the southern margin of the nearby Clay Belt. The nearest collections were made in the vicinity of Schreiber by Hosie, Losee & Bannan: the typical variety on Patterson I., No. 628; and, as treated in Gray's Man., the var. *kamchatica* Fisch., No. 633 (distributed as var. *glabra*).

Arabis glabra (L.) Bernh.

Math. road through jack pine forest (last flowers and immature fruits July 13, 1952), No. 3190.

Rare, found only once in our area, and not reported northward.

Arabis hirsuta (L.) Scop.

Kap. railroad ballast (last flowers and immature fruits July 24, 1952), No. 3485; Hst. clearing around fire-tower, No. 3765.

Rare, growing like a weed on a railway and a clearing at the western end of our region. Our material is the North American var. *pycnocarpa* (M. Hopkins) Rollins.

The Clay Belt lies close to the ranges of two more species of *Arabis* as shown in the maps of M. Hopkins (1937). Although there is little suitable habitat, these

should be added to the list of plants which may occur within the margins of our area. Hopkins cites a collection of *A. divaricarpa* Nels. from the Temagami Forest Reserve, W. R. Watson, No. 976, which is just a few miles south and west of the Little Clay Belt. *A. Holboellii* Hornem. var. *Collinsii* (Fern.) Rollins has been collected just west of the Clay Belt at L. Nipigon, John Macoun, No. 1685 (cited by Hopkins under *A. pendulocarpa*).

SARRACENIACEAE

Sarracenia purpurea L.

Amos, floating bog (in flower July 1, 1952), No. 2910; Math. floating bog, No. 3222.

Frequent and a characteristic plant of open, floating sphagnum bogs throughout the Clay Belt.

DROSERACEAE

Drosera intermedia Hayne

Amos, silted lake shore, No. 5477; Math. sedge marsh on silt, No. 3117; Tim. boggy shore of small lake, No. 4009; Gog. silted shore of small lake (in anthesis July 26, 1954), No. 6026.

Occasional throughout our region on silted and boggy shores of small lakes.

The range of *Drosera anglica* Huds. given in the manuals spans the Clay Belt: the New B. & B. notes "around the Great Lakes" and Gray's Man. lists L. Mistassini. It may have been overlooked in mistake for robust plants of the similar *D. intermedia* and may yet be found in our region, possibly in the calcareous areas around L. Timiskaming and L. Waswanipi.

Drosera linearis Goldie

Long. shore of muddy bay (last flowers July 30, 1952), No. 3621, and silted shore of the same lake, No. 3628.

Rare, found only once at the western end of the Clay Belt, and not reported northward.

Drosera rotundifolia L.

Amos, sandy, silted shore (in anthesis July 4, 1952), No. 3001; Tim. boggy shore of small lake, No. 4008; Gog. silted shore of small lake, No. 6024.

Frequent throughout the Clay Belt on silted and boggy shores and in sphagnum bogs.

Amos, floating sphagnum bog, No. 2911.

This collection has just one or two flower buds on each scape placing it with forma *breviscapa* (Regel) Domin.

Apparently rare and much less frequent than the many-flowered typical form.

CRASSULACEAE

SEDUM PURPUREUM (L.) Ling

S. Telephium ssp. *purpureum*, New B. & B.

NL. road embankment (not yet in flower June 14, 1952), No. 2590.

Seen only twice in the Clay Belt on roadsides where it was persisting probably after having been dumped there with garden trash. Not reported northward.

SAXIFRAGACEAE

Saxifraga virginiensis Michx.

LTQ. open rocky lake shore, No. 4732; Hail. rocky shelves in wet moss (in flower May 30, 1954), No. 5614; Dup. open rocky outcrop, No. 4124.

Occasional, and locally abundant in the L. Timiskaming portion of the Clay Belt on rocky shores and outcrops. Rare northward in our area, and not reported north of our area.

Saxifraga Aizoon Jacq. has been collected at several places on the north shore of L. Superior, the nearest being Schreiber, Hosie, Losee & Bannan, No. 2129. It is possible that this species also occurs within the margins of the Clay Belt although little suitable habitat is available.

Tiarella cordifolia L. was reported at Batchawana on L. Superior by Taylor (1938). This species may possibly be found in the L. Timiskaming portion of the Clay Belt along with other plants of the Great Lakes - St. Lawrence Forest.

Mitella nuda L.

LTQ. cedar woods on springy hillside (in anthesis June 6, 1953), No. 4686; NL. above creek in spruce-poplar woods, No. 2538; Kap. river-bank in cedar woods, No. 4909.

One of the commonest and most characteristic forest plants of the Clay Belt. Occurring with high frequency in the typical black spruce forest of our region, in cedar woods, and in damp humus and moss in the mixed deciduous-coniferous forest on the drier sites.

Chrysosplenium americanum Schwein.

Arnt. pool in low lakeshore woods (in flower June 21, 1952), No. 2789.

Found only once in our region and apparently rare, although this inconspicuous plant may have been overlooked. Not reported north of our region.

Parnassia parviflora DC. has been collected at many places along the north shore of L. Superior, the nearest being Schreiber; Hosie, Losee & Bannan, No. 2137. This species may occur within the margins of the Clay Belt.

Parnassia palustris L.

Coch. wet clearing on lake shore, No. 6161; LKap. grassy ditch beside railway No. 6055; Kap. around rocky pools at falls (in flower July 20, 1952), No. 3343.

In the western portion of the Clay Belt scarce on wet rocky shores and clearings and in ditches. Not seen in the vicinity of L. Timiskaming nor east of L. Abitibi. Our material is the North American var. *neogaea* Fern.

Parnassia glauca Raf. has been reported on L. Superior only at Batchawana by Taylor under the synonym *P. americana*. There is a possibility that this species may be found in the limestone area of L. Timiskaming.

Ribes hirtellum Michx.

NL. dwarf birch – leatherleaf bog (in anthesis May 29, 1954), No. 5613; Tas. alder-willow thicket in open black spruce bog, No. 5703; Tim. river-bank thickets beneath white spruce, No. 4757; Gog. rocky creek-bank (fruit ripe July 26, 1954), No. 6017; Hst. clearing on river-bank, No. 3716.

Frequent around the open margins of bogs, river-banks, and clearings.

The closely related species, *Ribes oxyacanthoides* L., has been collected all along the north shore of L. Superior by the Taylor and Hosie parties. The nearest station to the Clay Belt is Patterson I. near Schreiber, Hosie, Losee & Bannan, No. 2101. But they did not collect any specimens of *R. hirtellum*. Northward, however, DLD report both species present on the western slope of James B. It is curious that all our Clay Belt collections and observations are of *R. hirtellum* and that, despite careful searching, we found no *R. oxyacanthoides*.

Ribes lacustre (Pers.) Poir.

LTO. limestone talus slope (in anthesis May 27, 1954), No. 5558; Tim. rivershore thickets beneath white spruce, No. 4755; Kap. lakeshore balsam poplar woods, No. 4880; Hst. thickets on river-bank (in fruit August 3, 1952), No. 3740.

Common in mixed deciduous-coniferous forest, in shore thickets, low woods, and found once on a limestone cliff. Often growing with *R. glandulosum*.

Ribes glandulosum Grauer

LTO. limestone talus slope (in anthesis May 27, 1954), No. 5557; Amos, white spruce woods, No. 2929; Tim. young aspen poplar woods, No. 4743; Hst. clearing on river-bank (in fruit August 3, 1952), No. 3711.

Common in wet low woods, creek-banks, and clearings, frequent on drier sites in mixed deciduous-coniferous forest, and often occurring with *R. lacustre*.

Ribes triste Pall.

LTO. old elm woods (in anthesis May 28, 1954), No. 5582; NL. damp poplar woods on limestone ridge, No. 2475; Kap. lakeshore balsam poplar woods, No. 4879; Long. Kenogami R. bridge, No. 3684.

Occasional throughout our region in damp, low-lying deciduous woods.

Ribes hudsonianum Richards.

Kap. pulpwood railway through black spruce forest (in fruit July 20, 1952), No. 3365, and lakeshore thickets, No. 4861; Hst. clearing on river-bank, No. 3694.

Scarce, collected only at the western end of our area in shore thickets and clearings.

Ribes americanum Mill.

LTQ. elm-ash woods on lake shore (in flower June 8, 1953), No. 4737; LTO. lakeshore woods, No. 2504; Math. bank of creek outlet, No. 3276; Kap. river-bank in cedar woods, No. 4913.

Frequent in low woods and river-banks in the L. Timiskaming portion, less frequent northward in the Clay Belt. Listed northward on the Moose R. by Hustich (1955).

ROSACEAE

Physocarpus opulifolius (L.) Maxim.

Coch. wet rocky shore at rapids, No. 3977; Tim. lake outlet, rocky outcrop, No. 3986; Kap. rocky river-bank (fruit immature July 20, 1952), No. 3323; Hst. rivershore thickets, No. 3768.

Occasional throughout the Clay Belt, more frequent in the western portion, on wet rocky shores of rivers and lakes, in some places forming thickets along the rocky shores of rapids.

Spiraea alba Du Roi

NL. sandy roadside, through young jack pine–aspen poplar woods, No. 5261; Amos, willow thicket, river-bank (in anthesis July 5, 1952), No. 3016; Dup. lake shore of boulders and sand, No. 4104; Coch. sedge meadow around small lake, No. 5182; Gog. low river shore, No. 6012.

Occasional throughout our region, more frequent westward. Occurring in thickets on low shores of rivers and lakes, margins of meadows, and in wet openings. Reported northward (as *S. salicifolia*) in the James B. area by J. M. Macoun (1897).

Spiraea latifolia (Ait.) Borkh.

Tas. clearing on shore of Robertson L., No. 4246; and *Myrica-Chamaedaphne* thickets at L. Berry (in anthesis August 7, 1953), No. 5434.

This material has pyramidal inflorescences with elongate lower branches and belongs to the typical variety in the treatment of Gray's Man.

Amos, shore of Kinojevis R., No. 2975.

This specimen, lacking elongate lower branches in the inflorescences, is placed with var. *septentrionalis* Fern.

This species is scarce in our area occurring on shores and in clearings. It is listed northward on the Moose R. by Hustich (1955).

Spiraea tomentosa L.

Math. margin of pond on shore of Black R. (first flowers in anthesis July 18, 1952), No. 3281.

Found only once in our area and not reported northward.

Pyrus floribunda Lindl.

Aronia prunifolia, New B. & B.

LTQ. rocky crevices on open lake shore (in anthesis June 6, 1952), No. 4688; LWas. boulder shore in *Myrica* thickets, No. 5763; Amos, roadside ditch through *Chamaedaphne* bog, No. 5682; Coch. shore of small sandy lake (in fruit August 10, 1952), No. 3887.

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This material is distinguished from the very similar *P. melanocarpa* by the pubescent young branchlets and pedicels.

Occasional on rocky and sandy shores and in ditches throughout the Clay Belt. Not reported north of our region.

Pyrus melanocarpa (Michx.) Willd.

Aronia melanocarpa, New B. & B.

LTQ. lakeshore ashwoods, No. 4481; NL. spruce-larch bog (in flower June 13, 1952), No. 2555; OttR. open black spruce bog, No. 5827; Sen. margin of small boggy lake (fruit ripe September 6, 1952), No. 4387; VdO. bog at railway station, No. 3080.

Separated from the similar *P. floribunda* by the glabrous young branches and pedicels.

Occasional in open bogs and low-lying woods. Not reported northward.

Sorbus americana Marsh. American Mountain Ash

Pyrus americana, Gray's Man.

NL. flank of rocky outcrop (flowers in bud June 15, 1952), No. 2640; Sen. shore of small lake (fruit ripe September 7, 1952), No. 4396; LWas. trail through black spruce forest, No. 5737; LaS. thickets below rock outcrop, No. 2876; Coch. spruce-poplar forest at falls, No. 3522.

Frequent throughout the Clay Belt in moist openings in the forest, on shores, and in clearings. Often occurring with the similar *S. decora* and more frequent in the L. Timiskaming portion. Growing up to 20 feet high and 2 inches in diameter. The range of this species extends considerably farther north than the map shows in "Native Trees of Canada" (1949).

Sorbus decora (Sarg.) Schneid. Showy Mountain Ash

Pyrus decora, Gray's Man.

VM. roadside through spruce forest (fruit ripe September 12, 1952), No. 4506; NL. young birch-poplar woods on limestone, No. 2484; Sen. sandy shore, No. 4368; Arnt. hilltop, jack pine and birch woods (in anthesis June 20, 1952), No. 2743; LAO. spruce-poplar forest, No. 2852; Long. river shore, No. 3604.

Frequent throughout our region in openings in the forest, on shores, and in clearings. Often occurring with the similar *S. americana* and more frequent northward in our area. Growing up to 35 feet high and 4 inches in diameter.

Amelanchier spp. The serviceberries

This taxonomically difficult genus is plentiful in the Clay Belt. Our collection is therefore large (121), but it may not be truly representative of all the species occurring in our area. After several unsuccessful attempts to name our material satisfactorily using the conflicting treatments of Gray's Man., the New B. & B. as well as Wiegand (1912), Nielsen (1939), and Jones (1946), the specimens were all sent to Etlar L. Nielsen. Dr. Nielsen very kindly annotated the specimens and provided a valuable list and commentary. Dr. Nielsen's determinations, with his annotations in quotation marks, are given in the catalogue below wherein all our collections of this genus are cited.

The serviceberries appear to be much more abundant in the Clay Belt now than they were formerly. The disturbances of settlement, mining, and forestry have opened up new and favourable sites with much opportunity for hybridization. With our lack of understanding of this genus, field determinations were in most cases doubtful. Notes on frequency and habitat are therefore based chiefly on collection notes of the more certainly determined specimens.

Amelanchier sanguinea (Pursh) DC.

NL. ravine, poplar-spruce woods, 15 feet high (green fruit with purplish tinge June 17, 1952), No. 2695; LL. ashwoods, No. 2717; Math. trail through jack pine forest, No. 3212; Kap. river-bank thickets, No. 3304.

And as "not pure":

Amos, No. 2927; Coch. No. 3879.

Not surely recognized in the field but apparently one of the less frequent serviceberries of our area. Occurring in openings and clearings in the forest and in shore thickets.

Amelanchier huronensis Wieg.

Amelanchier sanguinea sensu G. N. Jones, in part, and similarly in New B. & B.

NL. brushwoods, balsam fir–balsam poplar, colonial shrub 7 feet high (in flower May 28, 1954), No. 5587; LTQ. clearing on lake shore, No. 4443; Coch. top of steep river-bank, No. 3962.

And as atypical:

VM. "leaves somewhat atypical in shape," No. 4510; LTQ. "atypical," No. 4428; LTQ. "Atypical. Probably a sucker shoot taken from a shaded plant. Possibly either *A. sanguinea* or *A. huronensis* complex," No. 4467; Arnt. "fruit small; racemes rather compact, otherwise *A. huronensis*," No. 2751; Hst. "may be atypical *A. huronensis*," No. 3779.

And as possible hybrids:

LL. "Leaves although small, are somewhat suggestive of *A. huronensis* in shape, serrations, indumentum. Fruit and raceme are those of *A. humilis*. Probably hybrid of these species," No. 2790; Math. "Fruits and hypanthium of *A. huronensis;* also buds. Leaves appear similar to those of *A. laevis*. Perhaps hybrid of these species," No. 3191.

The typical form was recognized occasionally in the field as locally abundant in clearings. The atypical and possibly hybrid forms make our field notes on frequency unreliable. Reported northward on the west side of James B. by DLD, whose material was also studied by Dr. Nielsen.

Amelanchier Wiegandii Nielsen

A. interior sensu G. N. Jones, in part; regarded as hybrid swarm by New B. & B.

LTQ. in young trembling aspen–birch woods, 25 feet high, 4 inches diameter (in flower May 27, 1954), No. 5570; Tas. hilltop, in stunted birch-woods, No. 5697; Amos, flank of rock knob, No. 5670; Arnt. jack pine and birchwoods on hilltop, No. 2747; Tim. rocky lake shore, No. 4045.

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And not so certain:

NL. "may not be pure as suggested by abortive small fruits," No. 4550; LTQ. "not pure," No. 4442; Arnt. No. 2746; LAO. "but probably not pure." No. 2847; LAO. "possibly a suckershoot or shaded specimen," No. 5128; Coch. No. 3882; Kap. "but not pure," No. 4870.

And as possible hybrid:

NL. "*A. Wiegandii* x *A. Bartramiana?* leaf shapes and fruit suggestive of former leaf margins are more suggestive of *A. Bartramiana.* If *A. Wiegandii* it is atypical," No. 2619.

This species occurs occasionally on drier sites in our region, in young woods, open jack pine forest, on hills, and on sandy and rocky shores. It is not listed in any collection from neighbouring areas. Gray's Man. gives its northern range from Newfoundland to Ontario. Possibly *A. Wiegandii* is at its northern limit in the Clay Belt.

Amelanchier humilis Wieg.

A. spicata sensu G. N. Jones, in part, and similarly in New B. & B.

LTO. top of limestone cliff. Young birch – trembling aspen woods. Straggling shrub 4 feet high (in flower May 27, 1954), No. 5562; LTO. No. 2508; NL. No. 2634; LAO. lakeshore clearing, 3 feet high, colonial, No. 5069; LAO. No. 5171; Coch. wet rocky shore at rapids, No. 3978; Math. about 8 feet high, forming thicket on river-bank, No. 3098; Math. Nos. 3291 and 3180; Tim. No. 4756; Tim. sandy, open jack pine forest, fragrant, colonies of many stems, No. 4750; Kap. clearing, gravel pit, No. 3482; Kap. No. 3354; Long. river shore, No. 3603.

And as atypical, queried and doubtful:

VM. "?" No. 5938; Tas. "atypically sharp leaf serrations," No. 5695; Coch. "?" No. 3881; Math. "?" No. 3274; Kap. "may be *A. humilis.* Fruits and racemes of this species. Venation, serrations and shapes of leaves atypical," No. 3498: Long "?" No. 3644.

And as possible hybrids:

NL. "*A humilis* but not pure, possible x 4 *A. laevis,*" No. 5590; Math. "somewhat like *A. intermedia* but leaves are of somewhat coarse serration. Ovary hypanthium constricted. More likely a hybrid of *A. humilis* x *A. laevis,*" No. 3152.

Frequently collected although not clearly recognized in the field. Forming colonies in openings and clearings in the forest and on shores. Reported north of the Clay Belt by DLD as fairly frequent in the southern part of the James B. region.

Amelanchier mucronata Nielsen (*A. spicata* sensu G. N. Jones, in part, and similarly in New B. & B.) has not been reported by any collector in the area immediately surrounding our region, which probably lies outside the range of this species.

On a doubtful specimen (LWas. sandy beach, recumbent shrub 2 feet high, No. 5768) Dr. Nielsen has noted: "Somewhat similar to *A. mucronata* but atypical as well as out of range?" This shrub was growing on one of the few large sandy beaches of our region and may have been injured by browsing, as Dr. Nielsen suggests, or by ice movement on the lake shore.

Amelanchier gaspensis (Wieg.) Fern. & Weath.

A. sanguinea var. *gaspensis*, New B. & B.

Dutilly & Lepage, Nos. 15,052 and 15,112, were collected on the Harricanaw R. between lat. 48° 20′ and 51° N. where it was noted as frequent (1952). The labels are marked "det. Nielsen" and on the accompanying map as located inside the Clay Belt. This species is also listed north of our region at Moose Factory, DLD and south of the Precambrian Shield in Ontario (Soper, 1949). None of our material was so named by Dr. Nielsen.

Amelanchier stolonifera Wieg.

A. spicata sensu G. N. Jones, in part, and similarly in New B. & B.

VM. clearing in red pine woods, shrubs 30 inches high, No. 4718; Dup. lake shore of sand and boulders, shrub 2 feet high, No. 4099; Tim. sandy, open, young jack pine forest, 5 feet high (in flower June 11, 1953), No. 4752; Math. roadside at creek, No. 3175; Kap. thickets on sandbar in Remi L. off creek, No. 4869; Long. roadside through black spruce forest, No. 3646.

And as atypical and queried:

Senn. "?" No. 4365; Amos, "?" No. 5671; Math. "?" No. 3182; Kap. "? atypical," No. 4943; LL. "?" No. 2719; Long. "?" Nos. 3643 and 3645.

A frequent low shrub, sometimes forming thickets, in openings and clearings in drier woods, young jack pine forest, roadsides, sandy and bouldery shores. This species apparently reaches its northern limit around Moosonee and the Rupert R. according to Dutilly and Lepage (1948).

Two collections doubtfully determined as *A. Fernaldii* Wieg. have been reported by DLD (1948 and 1954). These were collected considerably north of the Clay Belt on the Rupert and Albany rivers. No more references to this species were found in other collections and lists from the vicinity of our region.

There are no reports of *Amelanchier intermedia* Spach (*A. canadensis* sensu G. N. Jones, in part, and similarly in New B. & B.) in any list or collection from the vicinity of the Clay Belt. On a doubtful specimen (Math. No. 3152) Dr. Nielsen notes some similarity with this species in material which is more likely a hybrid of *A. humilis* x *A. laevis*.

Amelanchier arborea (Michx. f.) Fern.

A. canadensis sensu Wiegand.

LTQ. clearing on lake shore, 15 feet high, "appears to be close to *A. arborea* in the northeast of U.S.?" No. 4430; LTQ. from the same place "not entirely typical of N.E. material," No. 4439.

This species was collected only on the shore of L. Timiskaming where it reaches its northern limit apparently.

Amelanchier laevis Wieg.

NL. brushwood, young balsam fir – balsam poplar (in flower May 28, 1954), "typical," No. 5586; NL. open brushwood. Cluster of four stems, 30 feet high, 4 inches diameter, No. 5588; NL. Nos. 2627 and 2449; LTQ. foot of rocky outcrop, No. 4429; LL. Nos. 2705 and 2792; Math. trail through jack pine forest, No. 3210; Gog. young jack pine forest, straggling bush, 5 feet high, No. 6034.

And as atypical and "not pure":

Hail. "but with large hypanthium and some pubescence," No. 5620; VdO. "but not pure. Hypanthium and ovary summit of *A. humilis* complex. Mostly *A. laevis* however," No. 3053; LL. "but leaves approach those of *A. Wiegandii*," No. 2720; Math. "fairly good *A. laevis*. Some pubescence on ovary summit," No. 3223; Math. "may not be pure as indicated by ovary summit and hypanthium," No. 3282; Tim. "but rather small leaved," No. 3991.

And as hybrids:

LAO. "*A laevis* x *A. Bartramiana*," No. 5170; Math., "*A. laevis* x *A. Bartramiana*," No. 4591; Arnt. "*A. laevis* x *A. Bartramiana?*" No. 2750.

Common in the L. Timiskaming portion of the Clay Belt, less frequent elsewhere. Occurring in drier sites in openings and clearings in the forest. Not reported north of our region.

Amelanchier Bartramiana (Tausch) Roemer

NL. brushwood, young balsam fir – balsam poplar (in flower May 28, 1954), No. 5585; NL. sandy jack pine woods, 9 feet high, No. 2623; NL. Nos. 2552 and 2625; Amos, trail through white spruce woods, No. 2928; Amos, Nos. 5665, 2970, and 3023; Arnt. jack pine and poplar woods on rocky hilltop, No. 2744; LL. ashwoods, No. 2715; LL. Nos. 2807 and 2704; LAO. No. 5074; Math. No. 3111; Kap. lakeshore thicket, No. 4871; Long. roadside through black spruce forest, No. 3647.

And as atypical and "not pure":

VM. "fruit shape and leaf shape atypical for *A. Bartramiana*. Sepals and leaf serrations of *A. Bartramiana*. Probably of hybrid origin as indicated by characters referred to. Cymose inflorescence also of *A. Bartramiana*," No. 5986; LaS. "mostly *A. Bartramiana* but not pure. Inflorescence racemose rather than cymose," No. 2882; Math. "mostly *A. Bartramiana* but not pure as suggested by leaf bases and some of shapes. May be a specimen taken in shade," No. 3280; LWas. "fruit of *A. Bartramiana*. Also cuneate leaf bases. Leaves are suggestive of *A. laevis*. Perhaps of hybrid origin but closer to former species, No. 5738.

And as hybrids:

As "*A. Bartramiana* x — ?" NL. No. 2628; Amos, No. 2931; Math. No. 3232.

As "*A. Bartramiana* x *A. Wiegandii?*" Arnt. No. 2777; LL. No. 2808; Kap. No. 4868.

And Math. "*A. Bartramiana* x *A. humilis* or *A. stolonifera?*" No. 3211; Tas. "*A. Bartramiana* x *A. laevis?*" No. 5716.

This species is the most readily recognized and widely distributed serviceberry throughout the Clay Belt. It occurs in openings and clearings in the forest, in shore thickets, and is more frequent on wetter sites than the other serviceberries of our area.

Amelanchier, unnamed specimens.

LTQ. "suckershoot?" No. 4541; Amos, No. 4568; LWas. "somewhat similar to *A. mucronata* but atypical as well as out of range?" No. 5768; Dup. No. 4125; Kap. Nos. 3334 and 3335; Hst. No. 3790; Long. No. 3602.

Crataegus spp. The hawthorns

Collections were made from 18 hawthorns all cited below. It was possible to get flowers and fruits from the same tree in only four cases. The more certain determination of the Clay Belt material must await the attention of a specialist in this most difficult genus. Meanwhile our specimens have been doubtfully labelled.

Hawthorns occur occasionally on dry shores and clearings in our region, more frequently around L. Timiskaming, rarely northward. They have not been reported north of our region, although we made collections very close to the northern margin in Ontario (Hearst, No. 6129), and Dutilly and Lepage (1952) collected *C. chrysocarpa* up to lat. 49° 45′ N. on the Harricanaw R.

Crataegus ?chrysocarpa Ashe

LTQ. open rocky lake shore (in anthesis June 5, 1953), No. 4677, and same tree (in fruit July 24, 1953), No. 5278; VM. old clearing on lake shore, No. 4518; LTQ. creek-bank, grazed, No. 4398, and clearing on lake shore, No. 4432; LTO. clearing on lake shore (flowering), No. 2500, and same tree (fruiting), No. 5236; Dup. lake shore, sand and boulders, Nos. 4155 and 4156; LL. clearing around abandoned sawmill, No. 2794; Coch. river-bank, No. 3948; LKap. roadside through fields, No. 6099.

This is probably the commonest hawthorn in our region. Not reported northward.

Crataegus ?submollis Sarg.

VM. fence-row in clearing (fruiting heavily Sept. 12, 1952), No. 4519.

Collected but once in the L. Timiskaming portion of the Clay Belt where it probably reaches its northern limit for this longitude.

Crataegus ?succulenta Link

LTQ. creek-bank, grazed, No. 4407; VM. roadside through pine woods, No. 4709; LTO. clearing on lake shore (with last flowers June 12, 1952), No. 2502, and same tree (in fruit July 21, 1953), No. 5237; Tas. clearing on lake shore, No. 4241, and rocky islet, No. 4312; Dup. lakeshore thickets, No. 4103; Hst. creek-bank, alder thicket (fruiting), No. 6129, and same tree (flowering), S. R. Suter, June 6, 1955.

Our material is probably var. *macracantha* (Lodd.) Egglest. which has been reported (as *C. macracantha*) on L. Superior at Batchawana by Taylor, but not north of our region.

Crataegus ?Douglasii Lindl.

There are two specimens in the National Herbarium of Canada collected by W. J. Wilson and labelled *C. Douglasii* in J. M. Macoun's handwriting: near Abitibi L. (flowers in bud, June 8, 1902), and Abitibi R. between outlet of L. Abitibi and the mouth of the Black R. (three places) August 1901. This species has also been reported on L. Superior at Batchawana by Taylor, but not north of our region.

Fragaria virginiana Duchesne

LTQ. gravelly crevices in open rocky lake shore, No. 4678; NL. thin soil on limestone, pastured mixed woods (in flower May 27, 1954), No.

5551; LWas. grassy field, No. 5734; Amos, trail through white spruce woods, No. 2952; Tim. mossy zone in thickets around sedge marsh, No. 4798; Hst. thickets on river-bank (in fruit August 5, 1952), No. 3741.

Common in openings and margins of the forest throughout the Clay Belt in a wide variety of situations.

Fragaria vesca L.

VM. sandy bank on wooded lake shore, No. 4730; NL. thin soil on limestone, pastured mixed woods (in flower May 27, 1954), No. 5550; Kap. around rocky pools at falls, No. 3556; Hst. thickets on river-bank (in fruit August 3, 1952), No. 3742.

Occasional in sandy and rocky openings and margins of the forest. Usually on drier sites but sometimes occurring with *F. virginiana*. Reported northward at the foot of James B. by DLD. Our material is var. *americana* Porter.

Potentilla fruticosa L.

LTQ. open rocky lake shore, No. 4500; LTO. sandy shingle beach, No. 5234; LMat. rocky lake shore (in flower July 6, 1954), No. 5810; Tas. thicket on sandy river shore, No. 4266; Tim. lake outlet, rocky outcrop, No. 3987; Kap. rocky river-bank, No. 3324; Ger. roadside through sedge marsh, No. 6133.

The above specimens, and additional collections and observations, show much variation in foliage, villosity, and branching in response to different habitats. Some of our material might be placed with var. *tenuifolia* Lehm. as treated in Gray's Man., but, as Butters and Abbe (1953) remark: "it is doubtful whether this variety should be considered more than a form," and it is not mentioned in the New B. & B.

Occasional on open, rocky, and sandy shores, becoming more frequent westward in our region, where it is found on roadsides and clearings.

Potentilla tridentata Soland.

LTQ. open rocky lake shore, No. 4473; LWas. bare gravelly hillock, No. 5722; Arnt. crevices on rock face (first flowers June 20, 1952), No. 2739; Kap. open rocky shelves at falls, No. 3341; Long. roadside through jack pine forest, No. 3666.

Locally abundant on open, dry, rocky, and sandy habitats which are less frequent in the Clay Belt than in the surrounding Precambrian Shield, not submerged by proglacial Lake Barlow-Ojibway.

Potentilla palustris (L.) Scop.

Amos, *Chamaedaphne bog* (fruit flowers July 4, 1952), No. 2991; LaS. floating margin of cat-tail marsh, No. 5882; Arnt. wet place behind lake shore, No. 2784; LAO. rivershore thickets, No. 5079, and marshy river outlet, No. 5156; Coch. silted lake shore, No. 3933, and marshy shore of backwater, No. 3904.

This material shows much variation in leaf shape, the villosity of stem and leaves, and in the presence or absence of glandular hairs. In Nos. 3933, 5079, and 5156 the pedicels have many conspicuous glandular

hairs. The extreme condition is represented by No. 2784 (the furthest removed from water), which has leaflets densely villous and copious glandular hairs. It does not seem practical to distinguish the several forms.

Common in bogs and marshes.

Potentilla arguta Pursh

Collected at Ville Marie: colline de gravier, Marie-Victorin, Rolland-Germain & R. Meilleur, No. 44,956. This is the only collection from the Clay Belt where this species probably reaches its northern limit for this longitude.

Potentilla argentea L. Silvery Cinquefoil

LTO. roadside through grassy clearing, No. 5380; Gog. sandy, grassy field (in flower and fruit July 24, 1954), No. 5993; Long. clearing in jack pine forest, No. 3570.

A rare weed in dry, sandy clearings collected at three widely separate points in the Clay Belt where it was locally abundant. Not reported northward.

Potentilla pensylvanica L. has been collected on L. Superior at Schreiber by Hosie, Losee & Bannan, No. 1980; and was also reported on the western slope of James B. by DLD. Although there is little suitable habitat, this species may occur within the margins of the Clay Belt.

Potentilla recta L. Rough-fruited Cinquefoil

VM. roadside through fields (in flower and fruit July 22, 1954), No. 5988; NL. railway ditch through poplar woods, No. 2644; Gog. grassy clearing, old logging camp, No. 6009; Kap. gravel pit, No. 3480.

An occasional weed in the farmlands of the L. Timiskaming portion of the Clay Belt, rare northward in clearings, and not reported north beyond our area.

Potentilla norvegica L. Rough Cinquefoil

Including var. *hirsuta* (Michx.) Lehm.

VM. sandy clearing in birch woods, former pinery, No. 5917; LWas. grassy field, No. 5732; Arnt. sandy river-shore (first flowers June 21, 1952), No. 2763; LAO. rocky islets, No. 5116; IF. roadside through wet black spruce forest, No. 5054.

Common throughout our region on sandy shores, openings in the forest, roadsides, and clearings. Frankton (1955) remarks that "it is probable that much of the rough cinquefoil in Eastern Canada is of European origin."

Potentilla anserina L.

Dup. sandy lake shore, Nos. 4206 and 4238; Coch. shore of small lake, No. 3877; LKap. sandy lake shore, No. 6069; Kap. river shore (in flower July 26, 1952), No. 3505.

Scarce, on wet sandy and gravelly shores.

Two species of *Dryas* have been collected on the Slate Is. in L. Superior near Schreiber by Hosie, Losee & Bannan: *D. integrifolia* Vahl, No. 1924; and *D. Drummondii* Richards, Nos. 1915 and 1917. It is unlikely that they occur within the Clay Belt, although it is not far from these isolated stations.

Geum aleppicum Jacq.

VM. birch-maple woods on lake shore, No. 5951; NL. roadside through farmland, No. 5199; LAO. clearing on lake shore (in flower and immature fruit July 12, 1953), No. 5065; Coch. shore of small sandy lake, No. 3883.

Occasional throughout the Clay Belt on shores, in damp, open deciduous woods, wet clearings, and roadside ditches. Our material is the North American var. *strictum* (Ait.) Fern.

Geum macrophyllum Willd.

LTQ. clay ditch through lakeshore ashwoods (in flower July 24, 1953), No. 5268; Tas. clearing on lake shore, No. 4269.

These specimens have leaves with the large rounded terminal segments of the typical variety.

Rare, found only on two lakeshore clearings.

VM. roadside through fields, No. 5989; Dup. lakeshore clearing, No. 4198; Coch. shore of small sandy lake, No. 3884; Math. margin of sedge meadow (in flower with immature fruits July 13, 1952), No. 3178.

These specimens, and all other collections and observations of this species, have the incised terminal leaf-segments of var. *perincisum* (Rydb.) Raup, which is much more frequent than the typical variety in our area.

Frequent throughout our region on open shores, in wet meadows, roadside ditches, and wet clearings.

Geum rivale L.

NL. roadside through meadow (in flower June 14, 1952), No. 2591; Amos, ditch through meadow, No. 2988; Tim. drainage ditch in black spruce forest, No. 4807; Long. road through black spruce forest, No. 3577.

Occasional throughout our area occurring like a weed in ditches and wet clearings.

Rubus Chamaemorus L.

Tas. open black spruce bog (in anthesis June 10, 1954), No. 5687; IF. wet black spruce forest, No. 4784; Coch. wet trail through old black spruce forest, No. 3916; Long. small boggy lake, No. 3661.

Occasional throughout the Clay Belt and locally abundant in a few bogs and wet black spruce forests.

Rubus pubescens Raf.

LTQ. cedar woods on springy hillside (in anthesis June 6, 1953), No. 4687; NL. young birch-poplar woods on limestone, No. 2485; Tas. alder thickets and jack pine forest above lake shore, No. 5692; LAO. spruce-poplar forest, No. 2845.

Abundant. One of the most frequent and characteristic ground cover plants of the best black spruce forest of our region. Very frequent and abundant in the mixed deciduous-coniferous forest and found in a wide variety of woodland habitats.

Rubus paracaulis Bailey

With R. *arcticus*, Gray's Man. *See* Porsild (1951)

Tim. old black spruce forest (in flower June 20, 1953), No. 4835; Kap. boggy clearing beside stream, No. 3417, and old black spruce forest, No. 4970.

Collected three times and apparently rare in the Clay Belt, although it may have been overlooked when past flowering. Occurring in old black spruce forest and boggy clearing.

Rubus acaulis Michx.

NL. open bog (in flower June 14, 1952), No. 2574; Coch. shore of boggy pond, No. 3855; Kap. sedge marsh around small lake, No. 4930.

Occasional in our area in open bogs, sedge meadows, and wet, open, black spruce-larch woods.

Rubus parviflorus Nutt has been collected all along the north shore of L. Superior. The nearest station to the Clay Belt is at Schreiber, Hosie, Losee & Bannan, No. 2005. This species may occur nearby within the southwestern margin of our region.

Rubus idaeus L.

NL. roadside through poplar-spruce woods, No. 2675; LWas. grassy side of gravelly hillock, No. 5724.

As the bark of the primocane in these specimens is glabrous beneath the prickles, it places them with var. *strigosus* (Michx.) Maxim. in the treatment of Gray's Man. This and other varieties are treated in the New B. & B. as fluctuating variability in *R. strigosus*.

OttR. clearing around old camp, No. 5860; LaS. lake shore (in anthesis June 25, 1952), No. 2814; Tim. shore of small lake, No. 4056; Kap. rocky river-bank, No. 4942; Hst. thickets on river-bank, No. 3739.

The above series has the bark of the primocane cinereous-tomentulose beneath the prickles as in var. *canadensis* Richards.

Both varieties occur in the same habitats throughout the Clay Belt, occasionally in dry thickets on river-banks and shores, in openings in the forest, and abundantly on the borders of dry clearings and roadsides.

The European raspberry (RUBUS IDAEUS L.) is successfully cultivated on a small scale in our area, but was not seen established outside gardens.

Rubus hispidus L.

LTQ. open rocky shore (fruit ripe August 1, 1953), No. 5382, and from same place in previous years, No. 4482.

Found at only one locality on the shore of L. Timiskaming where this species is at its northern limit for this longitude.

Rubus canadensis L. occurs on L. Superior, the nearest station being Michipicoten, Hosie, Harrison & Hughes, No. 2237. This species may reach the southern margin of our region.

Agrimonia striata Michx.

VM. sandy clearing in birch woods, former pinery (in anthesis July 19, 1954), No. 5913; NL. thickets on rocky river shore, No. 5319; Dup. roadside, foot of rocky outcrop (in fruit August 20, 1952), No. 4132.

Occasional on dry shores, openings, and clearings in the L. Timiskaming portion of the Clay Belt. Rare northward in our area, and not reported north of our region.

The similar and more southern species, *Agrimonia gryposepala* Wallr., is unlikely to be found within our region. Material from the north shore of L. Superior is all *A. striata*. The nearest collection of *A. gryposepala* is from Sault Ste. Marie (No. 2054) reported by Taylor (1938).

Rosa nitida Willd.

VdO. thickets on sandy lake shore (in flower July 8, 1952), No. 3035.

This specimen has the very thorny stem, the pedicel and hypanthium stipitate glandular, and the shining, finely serrate leaf of *R. nitida*. In No. 4670, which was collected at the same place, the stem and leaf are similar, but the pedicel and hypanthium have no stipitate glands.

Rare, collected at just one sandy lake shore in the Quebec portion of the Clay Belt, and not reported northward.

Rosa palustris Marsh. has been collected on L. Superior only at Batchawana (Taylor). The range of this species may possibly extend to the southern margin of our region.

Rosa ?Woodsii Lindl.

R. Fendleri, New B. & B.

Two more collections were made near Val d'Or on the sandy shore of L. Blouin from the same extensive thicket as *R. nitida*, No. 3035. One of these, No. 4668, is doubtfully referred to *R. acicularis*. The other, No. 4670, at first suggested a hybrid of *R. nitida* x *R. acicularis*, but may be *R. Woodsii* var. *Fendleri* (Crepin) Rydb. This collection was taken from a shrub habitally like *R. nitida*, No. 3035, which grew nearby. Leaf characters lie between *R. nitida* and *R. acicularis*. Pedicel and hypanthium are glabrous. The stem, however, is less thorny than the other two specimens and has infrastipular thorns more differentiated.

The northern range of *R. Woodsii* var. *Fendleri* is western Ontario to British Columbia, according to Gray's Man. with the "typical and taller, more glabrous and glandular *R. Woodsii* more western." This species is listed by Dutilly and Lepage (1952) from the Harricanaw R., which flows through the northeastern margin of the Clay Belt.

Rosa acicularis Lindl.

VM. cut-over red pine woods (in fruit July 22, 1954), No. 5987; NL. clearing on limestone ridge (first flowers June 12, 1952), No. 2490; LWas. grassy clearing, No. 5735; Tim. steep sandy river-bank, No. 4831; Hst. clearing on river-bank, No. 4669.

Fruiting specimens in the above series all have the slenderly pyriform fruit of the typical form in the treatment of Gray's Man.

Common throughout the Clay Belt in openings on the drier forest sites, and in thickets, on dry shores, and in clearings.

Sen. sandy shores, No. 4367; Math. roadside through jack pine forest, No. 5536; Kap. rivershore cedar woods (in flower June 30, 1953), No. 4949; Hst. lake shore (in fruit August 3, 1952), No. 3736; Ger. young jack pine woods, No. 6132.

The fruit in this series has the subglobose form of var. *Bourgeauiana* Crepin, which is not kept separate in the New B. & B.

Often occurring with the typical variety and with about the same frequency, showing a little preference for drier habitats such as openings in the sandy jack pine forest.

Rosa blanda Ait.

VM. sandy clearing in birch woods, former pinery, No. 5915; IF. grassy clearing on clay shore (in flower July 9, 1953), No. 5040; Coch. river shore, No. 3954; LKap. sandy beach, No. 6052.

The above series is typical material of *R. blanda*, which shows a great range of variation in our area.

LAO. above rock lake shore, No. 5073; Math. river-bank, No. 3099.

These specimens have stipitate glands suggesting hybridization with *R. acicularis*.

Long. lake shore, No. 3639; Ger. sandy lake shore, No. 6144.

These two collections from the western end of the Clay Belt have glabrous leaflets and perhaps belong to the Great Lakes variant mentioned in the New B. & B.

Bell R. alder thickets on rocky shore of rapids, No. 5815.

In this specimen the leaflets are more numerous, mostly nine, and the sepals (at anthesis) very glandular, and it is referred to *R. blanda* with some doubt.

This species is frequent in the L. Timiskaming portion of the Clay Belt, and occasional northward, occurring on shores, in openings in the forest, and clearings.

Prunus nigra Ait. Canada Plum

LTQ. lakeshore thickets on Mann I., No. 4502; LTO. lakeshore thickets, No. 2509.

Found only in the L. Timiskaming portion of the Clay Belt where this species is rare and reaches its northern limit for this longitude. We found no fruit and were too late for the flowering period. There were many dead shrubs in the thickets, and in 1954 we saw no living material.

Prunus pumila L.

LTQ. open rocky lake shore, No. 4411.

This specimen was collected in September and has no fruits left on it.

The ascending branches and branchlets and the narrow oblanceolate leaves place it with *P. pumila* in the treatment of Gray's Man.

Found only once in the L. Timiskaming portion of the Clay Belt where it probably reaches its northern limit for this longitude.

Prunus susquehanae Willd.

P. cuneata Raf., under *P. pumila* var. *cuneata* in the New B. & B.

Math. sand blowouts, in open jack pine forest (in fruit July 16, 1952), No. 3217; Gog. sandy roadside through jack pine forest, No. 5992.

Rare, found at two widely separated points in our region growing erect in sand in open jack pine forest. Not reported northward.

Prunus depressa Pursh

P. pumila var. *depressa*, New B. & B.

Dup. lake shore of boulders and sand (with fruit August 20, 1952), No. 4098, and from same lake, No. 4145.

Rare, found only on the shore of L. Duparquet prostrate over boulders and sand. Reported northward on the Albany R. by DLD.

Prunus pensylvanica L. f. Pin Cherry

NL. young poplar woods on limestone ridge, No. 2457; Amos, flank of rock knob (in flower June 8, 1954), No. 5672; LAO. eroding clay shore, No. 2863; Tim. sandy, open, young jack pine forest, No. 4751.

Common throughout the Clay Belt in dry openings in the forest and in clearings and recent burns.

The range of *Prunus serotina* Ehrh. mapped in the "Native Trees of Canada" (1949) comes close to the L. Timiskaming portion of the Clay Belt. Black cherry, however, was not collected by the Taylor and Hosie parties on the north shore of L. Superior, nor from any station close to our area.

Prunus virginiana L. Eastern Choke Cherry

VM. lakeshore clearing (in flower June 7, 1953), No. 4705; NL. young poplar woods on limestone ridge, No. 2448; LWas. sandy lake shore, No. 5766; Tas. lakeshore clearing (fruit ripe August 26, 1952), No. 4242; Math. banks of Black R. at creek outlet, No. 3275; Kap. sandy lakeshore thickets, No. 4875.

Common in the L. Timiskaming portion of the Clay Belt, occasional northward, and extending to the foot of James B. at Moose Factory; A. E. Porsild, No. 4658. Occurring in shore thickets, openings in the forest, and clearings.

LEGUMINOSAE

Trifolium pratense L. Common Red Clover

NL. roadside clearing (in anthesis June 17, 1952), No. 2680; OttR. sandy roadside through jack pine forest, No. 5871; Kap. eroded clay river shore, No. 4946.

Common throughout the farmlands, and an important forage plant. red clover is also grown for seed in the Little Clay Belt. It is one of the

plants which have spread from fodder for horses used in pulpwood operations along roadsides and into remote clearings. It occurs northward beyond our area.

TRIFOLIUM REPENS L. White Clover

NL. roadside clearing (in flower June 17, 1952), No. 2681; OttR. lakeshore clearing, No. 5831; Tim. sandy roadside through jack pine forest, No. 4800.

Common throughout the farmlands, found in pasture fields, found occasionally along roadsides, in clearings in the forest, and northward beyond our region.

TRIFOLIUM HYBRIDUM L. Alsike Clover

NL. roadside clearing (in flower June 17, 1952), No. 2682; IF. young poplar woods on clay, No. 5048.

Common on roadsides and grazed woods in the farmland, and occurring rarely in openings and clearings in the forest and northward beyond the Clay Belt. Dr. Wiancko of the Experimental Station, Kapuskasing, noted that this is the most common clover in the area, occurring in most hay fields and some pasture fields.

TRIFOLIUM AGRARIUM L. Yellow or Hop-clover

Amos, railway through poplar woods, No. 3003; LL. roadside cutting (in anthesis June 19, 1952), No. 2729; Coch. trail in black spruce forest, No. 3929.

Occasional in farmlands and clearings and along roadsides. Not reported northward.

MELILOTUS OFFICINALIS (L.) Lam. Yellow Melilot (sweet clover)

Math. roadside, waste land near town (in flower July 17, 1952), No. 3243.

Occasional in farmlands and found rarely as a weed on roadsides and waste land around settlements. Not reported north of the Clay Belt.

MELILOTUS ALBA DESV. White Melitot (sweet clover)

OttR. clearing at fire-tower, No. 5857; VdO. railway station yard (in flower July 10, 1952), No. 3079.

Occurring in the same habitats as M. OFFICINALIS, more frequent and extending into clearings in the forest. Reported at the Moosonee railhead at James B. by DLD.

MEDICAGO SATIVA L. Alfalfa

NL. roadside through farmlands, No. 5201; Math. road embankment at bridge (in flower July 17, 1952), No. 3258.

Occasionally persisting in old pastures and found rarely along roadsides. Not reported north of our region.

MEDICAGO LUPULINA L. Black Medick

VM. gravelly road cutting (flowers and young fruit June 7, 1953), No. 4706.

This specimen has no stalked glands on the peduncles, placing it with the typical variety in the treatment of Gray's Man.

Collected only once and apparently less frequent in the Clay Belt than the var. GLANDULOSA.

VM. large-toothed aspen woods, No. 5963; NL. roadside through limestone exposure, No. 5318; Math. clearing around old camp (flowers and young fruits July 13, 1952), No. 3156, and roadside at river shore, No. 3270.

This material has divergent stalked glands on the peduncles and belongs to var. GLANDULOSA Neilr.

Occasional in waste places, along roadside, and found rarely in clearings in the forest. Not reported northward.

Astragalus ?linearis (Rydb.) Porsild *See* Rhodora 41:250 (1939)

LTQ. rocky lake shore, No. 4423.

This specimen was collected September 10, 1952, when most of the light green, glabrous leaflets had fallen, and the long stipitate, lunate legumes were empty. It is therefore referred to this species doubtfully. If this determination is correct, then this collection represents a considerable range extension eastward from Manitoba into the range of Gray's Man., in which it is not listed.

Collected only once on the open rocky shore of L. Timiskaming.

Astragalus eucosmos Robins. has been collected at Rapide Tanbell, Harricanaw R., 48° 20′–51° N., Dutilly & Lepage, No. 15,132. Although this range of latitude straddles the northern margin of the Clay Belt, this station is probably a few miles north of our area. However, this species should be kept on the list of possibilities and probabilities for future collectors in the Clay Belt.

Astragalus alpinus L.

Kap. rocky river-bank (in fruit July 20, 1952), No. 3328, and rocky shelves at rapids (in flower June 27, 1953), No. 4919.

Rare, found at only one locality in the Clay Belt along a rocky shore of the Kapuskasing R., where it was locally abundant.

Astragalus canadensis L.

Hst. clearing, old lumber camp (in fruit August 6, 1952), No. 3823.

Rare in the Clay Belt and found only once at an old lumber camp in the western portion of our area. Although the manuals include Hudson B. in its range, this species was not reported on the western slope of James B., nor recorded elsewhere north of our region.

The range of *Oxytropis johannensis* Fern. comes close to the northern margin of the Clay Belt, and this species possibly will be found within our region. The nearest collection is from the Moose R. estuary; Baldwin, No. 1375. There is much less likelihood of finding *O. splendens* Dougl., which was collected on the north shore of L. Superior, only in Sibley Twp.; Taylor, Losee & Bannan, Nos. 2194 and 2195.

Hedysarum alpinum L.

NL. crevices in rock cliffs at high falls on Englehart R., No. 5326; Coch. rocky shore of Frederick House R. (mostly in fruit with a few late

flowers August 12, 1952), No. 3956; Hst. path on bank of Shekak R., No. 3777.

The flowers are all less than 1.5 mm. long and the stems tall, placing this material with var. *americanum* Michx.

Rare, found on open shores of rivers at three widely separate localities in the Clay Belt.

Kap. rocky river shore (in fruit July 20, 1952), No. 3317.

This collection has the hispidulous legumes of var. *philoscia* (A. Nels.) Rollins, which is not listed in Gray's Man. nor in the New B. & B.

Collected only once in the Clay Belt and apparently not as frequent as var. *americana*.

Desmodium canadense (L.) DC.

LTQ. rocky lake shore (a few old fruits remaining September 11, 1952), No. 4488.

Rare, collected only on L. Timiskaming where this species probably reaches its northern limit for this longitude.

VICIA ANGUSTIFOLIA Reichard Narrow-leaved Vetch

This weed has been collected at Haileybury; along roadside, sandy loam soil, a small patch, by Bassett & Bragg, No. 1233 (DAO). It was not seen nor reported north of this L. Timiskaming station. This material is var. SEGETALIS Thuill. W. D. J. Koch.

Slender vetch, VICIA TETRASPERMA (L.) Moench, may also turn up in the Clay Belt, having been reported on L Superior at Batchawana by Taylor.

VICIA CRACCA L. Tufted Vetch

NL. old field (in flower June 17, 1952), No. 2661; OttR. lakeshore clearing around lumber camp, No. 5833; Math. sand pit in clearing, No. 4830; Kap. path along river shore, No. 4594.

A common weed throughout the Clay Belt in fields, on roadsides and trails into the forest, and northward beyond our region.

Vicia americana Muhl.

LTQ. open rocky hillside, *Diervilla* thicket, (in flower June 6, 1953), No. 4699; LTO. lakeshore thickets, No. 2511; Kap. rivershore thickets, No. 3313; Hst. thickets on river-bank, No. 3747.

This series belongs to the typical variety, having obtuse leaflets.

Occasional in thickets on shores, and in openings in the forest.

Kap. path along river shore (with flowers July 20, 1952), Nos. 4595 and 3355.

This material has the conspicuously truncate leaflets on upper leaves of var. *truncata* (Nutt.) Brewer.

Found only at the western end of the Clay Belt growing near the typical variety which, according to Gray's Man., passes into it westward.

Lathyrus japonicus Willd. var. *glaber* (Ser.) Fern. is one of the small, isolated group of plants for which there remains suitable habitat on the north shore of L. Superior, but which would not be expected within the nearby Clay Belt.

Lathyrus palustris L.

LTQ. rocky lake shore, No. 4648; NL. river bar among boulders, No. 5329; Kap. rocky outcrop at falls (in flower July 26, 1952), No. 3558, and rivershore thickets, No. 3314; Hst. rivershore thickets, No. 3772.

The Clay Belt material of this polymorphous species varies considerably. In No. 3314 the stem is relatively stout and conspicuously winged, and the leaves are broad as in the typical variety. No. 4648 has the conspicuously-winged, stout stem, but the leaves are narrow. The remaining collections have comparatively slender stems with less conspicuous wings and narrow leaves, placing them with var. *linearifolius* Ser.

Occasional throughout the Clay Belt on open shores and in rivershore thickets.

Lathyrus ochroleucus Hook.

LTQ. open red pine woods on rocky hillside (flowers and immature legumes June 6, 1953), No. 4680; LTO. lakeshore thickets, No. 2503; Kap. river-bank thickets (fruit ripe July 20, 1952), No. 3298; Hst. path along river-bank, No. 3752.

Frequent throughout the Clay Belt in thickets, on river-banks and lake shores, and in openings in the forest.

Peas (PISUM SATIVUM L.) is a very minor crop, only 290 acres being sown in the Ontario portion of the Clay Belt in 1954. Not found spreading or persisting after cultivation.

Amphicarpa bracteata (L.) Fern.

LTQ. lakeshore ashwoods (with old empty legumes September 11, 1952), No. 4498.

Rare, found only once in the L. Timiskaming portion of the Clay Belt where this species reaches its northern limit for this longitude.

LINACEAE

LINUM USITATISSIMUM L. Flax

Long. railway embankment (in flower July 29, 1952), No. 3601.

Flax was reported sown (1954) on just 20 acres and only in the Timiskaming District of Ontario. Found once as a railroad weed and not reported north of our region.

OXALIDACEAE

Oxalis montana Raf.

O. Acetosella, New B. & B.

NL. cedar woods, No. 2651; Amos, white spruce woods (in flower July 3, 1952), No. 2971; LMat. black spruce-birch forest, No. 5802; Tim. pine forest on lake shore, No. 4081; Kap. spruce-birch-poplar forest, No. 4891.

Occasional in damp humus of old forests.

Reported northward on the Harricanaw R. by Dutilly and Lepage (1952).

Oxalis europaea Jord

VM. sandy clearing in birchwoods, former pinery (flowers and young fruits July 19, 1954), No. 5925.

This material has the glabrous upper leaf-surfaces, spreading hairs on pedicels, and villous stems of forma *villicaulis* Wieg.

Collected only once in the L. Timiskaming portion of the Clay Belt where this weedy species reaches its northern limit for this longitude.

GERANIACEAE

Geranium Bicknellii Britt.

NL. clearing on limestone ridge, thin soil (in flower June 12, 1952), No. 2489; LWas. burned black spruce forest, No. 5742; LaS. roadside clearing, No. 2883; Kap. open rocky hilltop, No. 4885.

Frequent throughout the Clay Belt in dry rocky openings, on roadsides and in clearings, and often locally abundant after forest fires.

POLYGALACEAE

Polygala paucifolia Willd.

LTQ. open red pine woods on clay and rock hillside, No. 4679; NL. thin soil on limestone, pastured mixed woods (in flower May 27, 1954), No. 5549; and sandy trail through young poplar woods, No. 2649.

Rare, in dry openings in the woods of the L. Timiskaming portion of the Clay Belt and collected northward; Murphy Twp. near Timmins, F. N. Cowell, June 20, 1954. Not reported north of our region.

Polygala Senega L. has been collected on the Harricanaw R., 48° 20′–51° N., Dutilly & Lepage, No. 15,195. Although this range of latitude straddles the northern margin of the Clay Belt, this station is probably a few miles north of our region. This species probably will be found within our area.

EUPHORBIACEAE

Euphorbia Helioscopia L. Sun Spurge

VM. clearing (past fruiting September 10, 1952), No. 4508.

A rare weed seen only at one clearing in the L. Timiskaming portion of the Clay Belt. Not reported northward.

Euphorbia Cyparissias L. Cypress Spurge

This species was collected at Timmins; sandy soil, an escape along roadside, Bassett & Bragg No. 1248 (DAO). Not reported northward.

Euphorbia supina Raf.

LTQ. open, rocky lake shore (with mature capsules September 11, 1952), No. 4483 (revised by G. A. Mulligan & D. R. Lindsay).

Rare, collected once on the shore of L. Timiskaming where this species reaches its northern limit for this longitude.

Two more native species of *Euphorbia* were collected near Schreiber by Hosie, Losee & Bannan and may be expected in the nearby Clay Belt. *E. serphyllifolia*

Pers. was collected at Pays Plat, No. 1405, mixed with the following species. *E. glyptosperma* Engelm. was collected at Jackfish, No. 1404 (revised by Mulligan and Lindsay from *E. serphyllifolia*.)

CALLITRICHACEAE

Callitriche hermaphroditica L.

Tas. shore of outlet, Octave R., No. 4313; Coch. marshy shore of small sandy lake (with immature fruits August 10, 1952), No. 3870; and silted potholes in one foot of water, No. 6164; Ger. creek through sedge marsh, No. 6149.

Occasional in shallow water and marshy shores throughout the Clay Belt.

Callitriche palustris L.

VdO. cold shallow stream, No. 5522; Amos, ditch in wet meadow (with young fruits July 3, 1952), No. 4569; Dup. wet ditch in black spruce forest, No. 4167; Math. flood meadow below falls, No. 3171; Gog. silted shore of small lake, 6 inches of water, No. 6023; Kap. marshy backwater of creek, No. 6110.

Common, remarkably variable in form in a wide variety of aquatic and very wet habitats. Spreading frequently into wet ditches.

Callitriche heterophylla Pursh has been collected on L. Superior at Michipicoten, Hosie, Harrison & Hughes, No. 247. It is possible that this species will be found within the southern margin of the Clay Belt.

EMPETRACEAE

We searched carefully in exposed places for the two species of *Empetrum* which occur close to the southwest and northeast margins of the Clay Belt but could not find them. The nearest station on L. Superior is Schreiber where Hosie, Losee & Bannan have collected *E. nigrum* L. on Mortimer I., No. 1169; and *E. atropurpureum* Fern. & Wieg. at Terrace B., No. 1168 (revised from *E. nigrum*). For a discussion of these species on L. Superior *see* Butters and Abbe (1953). Northeast of our area at L. Mistassini, Rousseau & Rouleau have collected both *E. nigrum*, No. 400; and *E. atropurpureum*, No. 161. These species will probably be found somewhere within the margins of our area.

ANACARDIACEAE

Rhus typhina L. Staghorn Sumac

LTQ. clearing on lake shore (fruit mature September 10, 1952), No. 4436; NL. clearing on limestone ridge, thin soil, No. 2498.

Common in the L. Timiskaming portion of the Clay Belt where it reaches its northern limit for this longitude. Occurring in open rocky outcrops and on shores, and spreading in dry clearings. These collections represent a considerable northward extension of range from that shown in the map in "Native Trees of Canada" (1949).

Rhus glabra L. has been reported at Batchawana on L. Superior by Taylor. This species possibly will be found at the southern margin of the Clay Belt.

Rhus radicans L. Poison Ivy

LTO. lakeshore bank (in flower June 12, 1952), No. 2505; Dup. lake shore, boulders and sand, No. 4141; Tim. trail to lake, No. 4052.

All the Clay Belt material, collected and observed, had the short stems of var. *Rydbergii* (Small) Rehd.

Frequent in the L. Timiskaming portion of the Clay Belt, rare northward in our area. Poison ivy occurs in large colonies on rocky and gravelly shores of L. Timiskaming and less frequently on margins of clearings and trails in the forest. Not reported northward.

AQUIFOLIACEAE

Ilex verticillata (L.) Gray

LTQ. lakeshore thickets, No. 4418; OttR. rocky shore, thickets, No. 5843; VdO. sandy lake shore (flowers in bud July 8, 1952), No. 3036; Gog. river shore, No. 6011.

Occasional, in thickets on rocky and sandy shores. Not reported north of our area.

Nemopanthus mucronata (L.) Trel.

NL. opening in jack pine forest, No. 2609; LWas. rocky river shore, alder thickets, No. 5752; Tas. thickets on sandy lake shore (in anthesis with expanding leaves June 10, 1954), No. 5684; Amos, lakeshore thicket (fruit ripe August 14, 1953), No. 5473; LL. roadside through ashwoods, No. 2716; Gog. river shore, *Myrica* thicket, No. 6010.

Frequent, in thickets on rocky and sandy shores, and in damp openings and clearings in the forest. Not reported northward.

CELASTRACEAE

Celastrus scandens L.

VM. scrambling on hawthorn in clearing, No. 4516, and, at the same place, cemetery fence in old clearing (with young fruits July 22, 1954), No. 5984.

Rare, found only at a very old clearing (Fort Timiskaming) on the shore of L. Timiskaming where this species reaches its northern limit for this longitude.

ACERACEAE

Acer spicatum Lam. Mountain Maple

NL. young birch-poplar woods on wet limestone (in anthesis June 11, 1952), No. 2463; LaS. lakeshore poplar-birchwoods, No. 2817; LAO. river-shore alder thicket (with immature fruit July 17, 1953), No. 5174; Kap. ravine, white spruce woods, No. 5018.

Common throughout the deciduous woods of the Clay Belt, often forming a conspicuous layer in the understory. Occurring also in mixed deciduous-coniferous forest, in openings, and along shores in alder thickets.

Acer pensylvanicum L. Striped Maple

LTQ. lakeshore clearing, No. 4455.

Rare, only one tree (collected September 10, 1952, with no fruit) found in a clearing in a former pine forest on the shore of L. Timiskaming where this species reaches its northern limit for this longitude.

Acer saccharum Marsh. Sugar Maple

LTQ. lakeshore woods, No. 4419; Hail. river-bank in poplar–white pine woods, tree 16 inches in diameter (fruit nearly mature July 31, 1953), No. 5373.

Occasional in the L. Timiskaming portion of the Clay Belt where it reaches its northern limit for this longitude. It now occurs on the best remaining woodland sites. It was certainly much more common before clearing of the farmlands, and the bad fires of early settlement reduced its former area by taking the best land which it once occupied. Sugar maple is now planted occasionally in the towns of the L. Timiskaming region, and perhaps it will also increase in the farm wood lots, which are now occupied by poplar following fires.

Acer rubrum L. Red Maple

LTQ. rocky lake shore, No. 4409, and spring outlet at rocky lake shore, No. 4697; NL. shore of small sandy lake, No. 2621; Dup. flank of rock outcrop, No. 4221; Arnt. on talus slope (fruit mature June 20, 1952), No. 2740; Math. lake shore near spring, No. 3292; Tim. pine forest on lake shore, No. 4082.

Of this series, Nos. 4409 and 4697 from the rocky shore of L. Timiskaming have the strongly 3-lobed leaves with rounded to somewhat cuneate bases of var. *trilobum* K. Koch, differing from the remainder which have 3- to 5-lobed leaves with subcordate bases. According to Gray's Man. var. *trilobum* passes insensibly into the typical form, and the New B. & B. states that it has no claim to taxonomic recognition.

Frequent close to shores, and in openings in the forest, in the L. Timiskaming portion of the Clay Belt, diminishing northward in our region.

Acer saccharinum L. Silver Maple

VM. lakeshore woods, Nos. 4515 and 4529; NL. low river-bank, No. 5335.

Occasional in low woods near shores of lakes and rivers in the L. Timiskaming portion of the Clay Belt where this species reaches its northern limit for this longitude. The silver, like the sugar maple, has lost much of its former habitat in this region by the clearing of the farms and the bad fires of early settlement. Observations on flowers and fruits are lacking. This collection represents a considerable northern extension of range from the map in "Native Trees of Canada" (1949).

Acer Negundo L. Manitoba Maple

VM. creek-bank, well escaped, No. 4527; Tas. lakeshore clearing, tree 25 feet high, 6 inches in diameter (fruit mature August 26, 1952), No. 4243.

These collections have the glabrous and very glaucous twigs of the Middle Western North America var. VIOLACEUM (Kirchner) Jacq.

Commonly planted in the towns and farmsteads of the Clay Belt. Rarely escaping along creeks and shores. Not reported northward.

BALSAMINACEAE

Impatiens capensis Meerb.

I. biflora, New B. & B.

LTQ. clay ditch through lakeshore ashwoods, No. 5273; Math. ditch through poplar woods (flowers in bud July 16, 1952), No. 3207; LKap. bank above marsh, No. 6097; Hst. damp rivershore thickets, No. 3769.

Common throughout the Clay Belt in wet humus of low woods, shore thickets, margins of marshes, and wet shaded ditches.

Tim. roadside through black spruce forest (in flower and fruit August 15, 1952), No. 4012.

This specimen has the light cream-coloured flower with dark spots of forma *albiflora* (Rand & Redf.) Fern. & Schub.

This form found only once.

RHAMNACEAE

Rhamnus alnifolia L'Hér. Alderleaf Buckthorn

LTO. sand and shingle beach (fruit ripe July 21, 1953), No. 5233; LWas. *Myrica* thickets on boulder shore, No. 5762; LaS. roadside clearing, No. 2885; Tim. opening in black spruce-cedar woods (in anthesis June 17, 1953), No. 4806; Gog. grassy creek-bank, No. 6021.

Common throughout our region, forming thickets on shores, occurring also in damp openings in the forest, in wet clearings, and on roadsides. Often infested with rust.

Ceanothus ovatus Raf.

LTQ. lakeshore thickets, No. 4421; VM. sandy bank below red pine stand, No. 5981; and steep open bank below red pine and cedar woods (fruit ripe July 24, 1953), No. 5284.

Rare, found only in vicinity of old Fort Timiskaming where this species reaches its northern limit for this longitude. Locally abundant on the open shore and margin of this old clearing where it was first collected in 1933 by Victorin, Germain & Meilleur, No. 44,961.

VITACEAE

PARTHENOCISSUS INSERTA (Kerner) K. Fritsch

P. vitacea, New B. & B.

VM. fence on roadside through settlement, escaping from cultivation (in anthesis July 22, 1954), No. 5990.

This material has no alhesive discs on the tendrils, and the relatively few-flowered inflorescences are dichotomously branched, thus distinguishing it from the similar *P. quinquefolia* (L.) Planch.

We saw no Virginia creeper occurring naturally in our region. The colony from which this specimen was taken had obviously escaped over the fence from a garden. It has not been reported north of the L. Timiskaming portion of the Clay Belt. *P. quinquefolia* is probably not sufficiently hardy to grow in our area.

Vitis riparia Michx.

LTQ. open rocky lake shore (no fruit on September 11, 1952), No. 4486.

Rare, found only on the shore of L. Timiskaming where this species reaches its northern limit for this longitude.

TILIACEAE

Basswood is mentioned by Halliday (1937) ". . . scattered along the rivers throughout . . ." the Haileybury Forest Section, which corresponds to the L. Timiskaming portion of the Clay Belt. The range map for *Tilia americana* L. in "Native Trees of Canada" (1949) also includes L. Timiskaming. It was not reported, however, by Taylor from Batchawana nor collected at other points along the north shore of L. Superior in subsequent years by the Hosie and Taylor parties. We searched carefully for basswood along the southern margin of our area without finding it. E. K. E. Dreyer and the foresters of the Ontario Department of Lands and Forests in the district also confirm our observation that there is no naturally occurring basswood in the Clay Belt. There remains the possibility that it has become extinct following settlement, but it is unlikely that clearing would completely eliminate this tree from the remaining woodlands at such places as Dawson Point and along the Blanche R., which we examined closely.

MALVACEAE

Malva neglecta Wallr.

Tim. vacant town lot (with fruits August 19, 1952), No. 4633.

This collection has the carpels rounded on the back and not rugose-reticulate as in the similar M. rotundifolia L.

A rare weed of waste land in the Clay Belt where it probably reaches its northern limit for these longitudes.

The nearest record of Malva rotundifolia L. is in Sibley Twp. by Taylor, Losee & Bannan, No. 1906. There is a possibility that this species may be found naturalized at the western end of the Clay Belt.

Malva moschata L.

LTQ. roadside along rocky lake shore (in flower September 11, 1952), No. 4469.

This specimen has the crenate lower leaves and the upper laciniate as in forma heterophylla (Vis.) Hayek which Gray's Man. notes as commoner than the typical form.

Seen only once in the L. Timiskaming portion of the Clay Belt. Not reported northward.

GUTTIFERAE

Hypericum perforatum L. Common St. Johns-wort

VM. clearing, No. 4512, and sandy roadside through red pine stand (in flower July 19, 1954), No. 5937; NL. roadside through farmland, No. 5197.

An occasional weed of farmlands, dry roadsides and clearings in the L. Timiskaming portion of the Clay Belt. Not reported northward.

Hypericum ellipticum Hook.

NL. open alluvial shore, No. 5294; OttR. gravelly lake shore (in flower July 15, 1954), No. 5870; VdO. floating bog, No. 3077; Amos, silted lake shore (in fruit August 14, 1953), No. 5478.

Common in wet open places and locally abundant on alluvial shores. Not reported north of the Clay Belt.

Sen. rivershore thickets, No. 4348; Tas. alluvial river shore, No. 4295; Dup. lake shore, silted bay, No. 4111.

These specimens have ascending leafy branches overtopping the cyme as in forma *foliosum* Vict.

This form was found in similar wet places, less frequent, but sometimes (No. 4348) growing with the typical form which has the cyme borne above the foliage.

Hypericum boreale (Britt.) Bickn.

Tas. alluvial river shore (in fruit August 29, 1952), No. 4297; Gog. silted shore of small lake (in flower July 26, 1954), No. 6028.

Rare, found on silted shores only at two widely distant points in the Clay Belt. Not reported northward.

Hypericum majus (Gray) Britt.

Tas. silted bay of sandy L. Berry (fruit August 31, 1952), No. 4329; Dup. loamy margin of shallow lake, No. 4224.

In No. 4329 the upper leaves are broad and prevailingly lanceolate, the inflorescence relatively compact, thus placing it with this species. The smaller plants of No. 4224 are not so distinct from the similar *H. canadense* and are referred to *H. majus* with some doubt.

Rare in our region on wet silted shores. Reported northwest at our region in Precambrian country on the Albany R. by DLD.

Hypericum canadense L.

Tas. silted bay of sandy L. Berry (in fruit August 31, 1952), No. 4330.

The plants of this collection have the linear and narrowly oblanceolate leaves, and more diffuse inflorescence, which place it with *H. canadense* rather than the similar *H. majus*, which was collected at the same lake.

Rare, found once on silted shore, and not reported northward.

Hypericum dissimulatum Bickn.

Amos, silted shore of L. Roy (in flower with young fruit August 14, 1953), No. 5476.

This large collection, which appears intermediate between *H. canadense* and *H. boreale*, matches very closely specimens collected in Nova Scotia by Fernald & Long, which were referred to the puzzling species *H. dissimulatum*.

Rare, found only once at the eastern end of the Clay Belt where it was locally abundant on a silted lake shore. This collection represents a considerable extension northwestward of the range of this species.

Hypericum virginicum L.

Triadenum Fraseri, New B. & B.

Sen. clay creek-bank, No. 4340; Tas. alluvial river shore (capsules mature August 29, 1952), No. 4299; Dup. lake shore, silted bay, No. 4120; Coch. floating sedge bog (in anthesis July 19, 1953), No. 5179; Tim. sedge meadow around bog, No. 4066; Kap. margin of sedge marsh at small lake. No. 6124.

Common on wet silted shores and sedge meadows. Not reported northward. Our material is var. *Fraseri* (Spach) Fern.

ELATINACEAE

Elatine minima (Nutt.) Fisch. & Mey.

Sen. shallow water of sandy lake, No. 4376, and mud flats of the same lake shore which were under water in previous year (in fruit August 25, 1953), No. 5530.

Found only in one lake and apparently rare, although this inconspicuous little plant could have been easily overlooked elsewhere in the Clay Belt. Not reported north or west of our region.

CISTACEAE

Hudsonia tomentosa Nutt.

Tas. sandy blowout in jack pine forest, No. 4276, and same habitat 10 miles distant, No. 5439; Math. sandy blowouts in open jack pine woods (with late flowers July 18, 1952), No. 3288.

Occasional, confined to open sandy places in the jack pine forest where it is locally abundant and the only plant growing on these exposed habitats. Not reported northward.

VIOLACEAE

Viola cucullata Ait.

NL. ditch through meadow, No. 2592; Amos, thickets on shore of creek (in flower June 8, 1954), No. 5662; Tas. bank of stream through boggy black spruce forest, No. 5706; LL. creek-bank in spruce-poplar woods, No. 2712; Tim. grassy creek-bank, No. 4838.

Occasional in the Clay Belt, on wet banks of creeks and ditches, sometimes in very large colonies. This species is listed (as *V. palmata* var. *cucullata*) northward in the James B. area by J. M. Macoun (1897), but there are no specimens in the National Herbarium of Canada to confirm this record. It is not reported north of our region by Potter (1934), DLD. or Hustich (1955).

The northern range of the similar species, *Viola papilionacea* Pursh is well south of our region, in southern Quebec, according to Gray's Man., and in the New B. & B

just Massachusetts to Minnesota. This species was not collected by the Taylor and Hosie parties on L. Superior, nor is it listed by J. M. Macoun (1895), Potter (1934), or Hustich (1955) in the southern James B. area. However it is catalogued at Albany on James B. by DLD, and on the Harricanaw R. by Dutilly & Lepage (1952), but I have not seen these specimens.

Viola nephrophylla Greene

LTQ. lake shore, ashwoods, No. 4497; LTO. open gravel shore (in flower May 27, 1954), No. 5576; Kap. river shore at falls, No. 3544; Hst. rivershore thickets, No. 3707; Long. silted shore, No. 3623.

Occasional in our region, on wet open shores, in thickets and low woods. Collected as far north as Charlton I. by A. E. Porsild, No. 4441.

Viola sororia Willd.

VM. lakeshore woods, No. 4528; NL. willow thicket, bottom of deep clay ravine (in flower May 29, 1954), No. 5608; Dup. lake shore, silted bay, No. 4109; Tim. cedar woods, No. 4002.

Occasional in wet thickets and low woods, and on shores. Not reported north of our region.

Viola septentrionalis Greene

VM. clay bank in pine woods, No. 4721; LTO. open gravel shore (in flower May 27, 1954), No. 5564; LWas. boulder shore on *Osmunda regalis* rhizomes, No. 5756; Sen. rivershore thickets, No. 4350; LL. creek-bank through spruce-poplar woods, No. 2710; Kap. spruce-poplar forest at falls, No. 3523.

Occasional, in damp open forest, creek-banks, and shore thickets. Dutilly and Lepage (1952) give its northern limit on the Harricanaw R. as lat. 49° 43′ N., which is within the margin of the Clay Belt.

Viola Selkirkii Pursh

NL. creek-bank in spruce-poplar woods, No. 2541; WasR. aspen poplar-birch woods, No. 5786; Dup. alder thicket on lake shore, No. 4197; Kap. river-bank in cedar woods, No. 4914; Hst. cut black spruce forest on slope (in flower June 3, 1954), No. 5639.

Scarce, in damp woods, creek-banks, and shore thickets. Not reported northward.

Viola pallens (Banks) Brainerd

NL. wet alder thickets, lake shore (in flower May 29, 1954), No. 5593; LWas. wet boulder shore in *Spiraea* thicket, No. 5751; Tas. bank of stream through boggy black spruce forest, No. 5709; Arnt. willow-alder thicket, No. 2778; Tim. open bog, in sphagnum, No. 4763; Kap. sedge marsh around small lake, No. 4933; Hst. ditch through wet black spruce forest, No. 5645.

Common throughout our area in a wide variety of very wet, open habitats and in thickets.

Viola incognita Brainerd

Amos, young black spruce – balsam poplar woods (in flower June 8, 1954), No. 5658; Tas. trail through black spruce forest, No. 5702; LL. creek

bank in spruce – poplar woods, No. 2708; Tim. young aspen woods, mossy floor, No. 4742; Kap. alder thickets around beaver pond, No. 4900.

In this series and in all other collections and observations, the foliage is nearly or quite glabrous, one plant sometimes bearing both glabrous leaves and leaves with a few scattered hairs. They have been referred, therefore, to var. *Forbesii* Brainerd.

Frequent in moist spruce-poplar woods, wet openings in the spruce forest, and in alder thickets. *V. incognita* is listed by Hustich (1955) northward on the Moose R.

Viola renifolia Gray

LTO. lakeshore cedar woods (in flower May 27, 1954), No. 5572; VdO. birch-spruce woods on lake shore, No. 4575; LL. alder thicket around open bog, No. 2756; Kap. spruce poplar woods at falls, No. 3530; Long. old white spruce forest, No. 3687.

In No. 3687 the leaf blades and petioles are still villous on August 1, 1952, as in the typical form; while in No. 3530 they are glabrous on July 26, 1952, as in var. *Brainerdii* (Greene) Fern. Between these extremes in other specimens, there are all degrees of persistence of villosity which make varietal separation not practical in the Clay Belt material.

Common in a wide variety of damp woodland habitats throughout our region.

Viola lanceolata L. has been collected at several stations on L. Superior, the nearest being Schreiber, Hosie, Losee & Bannan, No. 2208. This species will probably be found within the southern margin of the Clay Belt.

Viola pubescens Ait.

VM. clay-bank in pine woods, No. 4720; LTO. moist young birch-cedar woods (in flower May 27, 1954), No. 5563.

Rare, in woods of L. Timiskaming portion of the Clay Belt where this species reaches its northern limit for this longitude.

Viola pensylvanica Michx.

V. eriocarpa, New B. & B.

LTQ. lakeshore clearing, No. 4460.

This specimen has the woolly capsule of the typical variety in the treatment of Gray's Man.

Collected only once in the L. Timiskaming portion of the Clay Belt and apparently rare; although it may have been overlooked among the common var. *leiocarpa*.

LTQ. elm-ash woods, lake shore (in flower and with young capsules, June 8, 1953), No. 4738; LTO. rich woods, elm-ash, No. 2525; LL. creek-bank in spruce-poplar woods, No. 2713; Tim. river-bank thickets beneath white spruce forest, No. 4758; Hst. elm-ash woods, No. 6128.

This series has the glabrous capsules of var. *leiocarpa* (Fern. & Wieg.) Fern.

Frequent in low woods and creek-banks and locally abundant in elm-ash woods where this violet is a characteristic ground cover plant. Collected northward on the Moose R. by Hustich & Tuomikoski, No. 76.

Viola canadensis L.

NL. damp poplar-spruce woods on rocky outcrop (in flower June 17, 1952), No. 2670.

Rare, found only once in the Little Clay Belt where this species reaches its northern limit for this longitude.

Viola conspersa Reichenb.

LTO. elm-ash – balsam poplar woods on lake shore (in flower May 28, 1954), No. 5577; Tas. alder thicket in jack pine on lake shore, No. 5693; Coch. trail through old black spruce forest, No. 3918; Kap. drainage ditch through *Chamaedaphne-Ledum* bog, No. 4995; Hst. boggy ground around small lake, No. 3834.

Occasional in damp woods, thickets, and open boggy ground. Not reported north of our region.

Viola adunca Sm.

NL. sandy birch-aspen woods (in flower May 29, 1954), No. 5591; Amos, foot of rock knob, No. 5674; Dup. open rock outcrop, No. 4130; Math. sandy clearing around camp, No. 3164; Tim. sandy, open, young jack pine forest, No. 4748; Long. trail through old jack pine forest, No. 3670.

Common in sandy and rocky openings, and remarkably abundant in sandy jack pine forest following clearing or fire. Dutilly and Lepage (1952) give its northern limit on the Harricanaw R. as lat. 48° 51′ N., which is within the margin of our region.

All the Clay Belt material has the puberulence of the typical variety. The glabrous var. *minor* (Hook.) Fern. occurs northward; the nearest collection was made at Moose Factory by Baldwin, Hustich, Kucyniak & Tuomikoski, No. 879 (distributed as *V. labradorica*). We searched carefully for var. *minor* along the northern margin of our area but did not find it.

THYMELAEACEAE

Dirca palustris L.

Hail. young balsam poplar grove on river-bank (with young fruits May 30, 1954), No. 5619.

Rare, found once in the L. Timiskaming portion of the Clay Belt where it reaches its northern limit for this longitude.

ELAEAGNACEAE

Elaeagnus commutata Bernh.

LTQ. rocky lake shore, No. 4422, and old clearing on lake shore (in fruit September 13, 1952), No. 4534.

Rare, found only on the Quebec shore of L. Timiskaming. It is locally abundant in the clearing around old Fort Timiskaming where it was previously collected in 1943 by Sebastian Baril, No. 1536.

This colony at old Fort Timiskaming has been described as a new species (*E. veteris-castelli* Lepage, in Le Naturaliste Canadien 82: 1–5,

1955) distinguished from *E. commutata* chiefly on differences in the form and structure of the stone of the fruit.

Shepherdia canadensis (L.) Nutt.

LTQ. clearing on lake shore, No. 4445; NL. clearing on limestone ridge, thin soil (in flower June 12, 1952), No. 2491; Kap. rocky shelves at rapids, No. 4922; Hst. rocky clearing beside river, No. 3775.

Common in dry openings and clearings in the L. Timiskaming portion of the Clay Belt, rare northward on open rocky river shores.

LYTHRACEAE

Lythrum Salicaria L.

VdO. railway yards in town, No. 5529; Kap. waste land at rocky falls (in anthesis July 20, 1952), No. 3347.

These specimens have the white-tomentose calyx and bracts of var. TOMENTOSUM (Mill.) DC., to which belong most of the plants from the Great Lakes and St. Lawrence Valley according to the New B. & B.

Rare, growing vigorously on wet ground near a few towns. Collected also at Timmins by F. N. Cowell, July 23, 1955. Not reported northward.

ONAGRACEAE

Epilobium angustifolium L. Fireweed

VdO. roadside through black spruce forest (in flower July 8, 1952), No. 3054.

This specimen has the purplish flowers of the typical form.

Common on roadsides and clearings throughout the Clay Belt, frequent in the drier mixed deciduous-coniferous forest, and locally abundant following forest fires.

Tas. lakeshore clearing, No. 4316; Gog. sandy roadside through black spruce forest (in flower July 26, 1954), No. 6031; Long. old lumber camp clearing, No. 3571.

These collections have the white flowers of forma *albiflorum* (Dumort.) Haussk.

The white form was seen only at three widely distant clearings.

Epilobium leptophyllum Raf.

Dup. silted shore of shallow lake, No. 4228; Coch. floating sedge bog, No. 5178; Math. willow thickets (flowers and young capsules July 13, 1952), No. 4582; Kap. river shore, No. 3385.

Common on wet silted shores, in open thickets and sedge marshes. Not reported northward.

For the closely related *Epilobium strictum* Muhl., the northern limit of range given in the manuals is Quebec to Minnesota. It was not collected in the Clay Belt nor at the nearest stations on the north shore of L. Superior by the Taylor and Hosie parties (their material was distributed as *E. densum* as in Gray's Man. ed. 7.). In DLD's catalogue, the only collection cited is a specimen from Moosonee, which I have not seen.

Epilobium palustre L.

Sen. ditch through black spruce forest, Nos. 4362 and 4644; Tim. lumber road through cedar woods (with flowers and fruit August 15, 1952), No. 3998.

These three collections have narrow leaves (less than 3 mm. wide), fruiting pedicels much overtopping the subtending leaves and therefore do not belong to the typical variety in the Gray's Man. treatment of this polymorphic species; Nos. 3998 and 4644 have axillary fascicles and erect branches suggesting var. *grammadophyllum* Haussk. The plants in No. 4362, from the same place as No. 4664, are simple and small with blunt leaf tips and ascending pedicels suggesting var. *oliganthum* (Michx.) Fern.

This species was collected at two widely separated places in roadside ditches through wet forest. It is apparently rare, although it may have been overlooked in the field in mistake for other similar species.

The range of *Epilobium leptocarpum* var. *Macounii* Trel. given in the manuals extends from Newfoundland to British Columbia. There is only one collection taken anywhere near the Clay Belt and that is from Sibley Twp., Taylor, Losee & Bannan, No. 810. There is a possibility that this species may be found within our region.

Epilobium glandulosum Lehm.

Under *E. adenocaulon* in the New B. & B.

LTO. margin of ash-elm woods, No. 5245; LAO. rocky islets, No. 5118; Coch. silted shore, No. 3934; Math. *Chamaedaphne* bog around small lake (with flowers and young fruits July 13, 1952), No. 4672; Kap. woods on river-bank, No. 4598.

This series has the ovate to ovate-lanceolate median leaves of var. *adenocaulon* (Haussk.) Fern. in this highly variable species.

Common throughout the Clay Belt on wet soil of shores, thickets, low woods, and clearings.

VM. sandy clearing in birch woods, former pinery, No. 5922; VdO. sandy lake shore, No. 3041; Amos, white spruce woods (in flower, with young fruits July 3, 1952), No. 2953; LAO. wet rivershore clearing, No. 5096; Math. *Chamaedaphne* bog around small lake, No. 3104.

This series represents the collections with elongate-lanceolate median leaves, which are referred to var. *occidentale* (Trel.) Fern. According to the New B. & B. var. *adenocaulon* passes into var. *occidentale* westward. The Clay Belt material is doubtfully sorted into the two varieties.

In the Clay Belt var. *occidentale* is equally as common as var. *adenocaulon* and occurs in the same habitats.

Oenothera biennis L. Common Evening Primrose

An old fruiting (Sept. 8, 1952) specimen of this species was collected at Kapuskasing by E. G. Anderson, No. 1885 (DAO), and identified by D. R. Lindsay. Reported north of our region by DLD at Moose Factory.

Oenothera parviflora L.

LTO. sandy shingle beach, No. 5231; IF. railway through young jack pine forest, on sand (first flowers July 9, 1953), No. 5030; LAO. sandy

beach at creek outlet, No. 5129; Math. roadside ditch through black spruce forest, No. 3184; Coch. shore of small sandy lake, No. 3876.

Occasional on sandy shores and railroads and on clearings.

Oenothera Nuttallii Sweet was collected once on the north shore of L. Superior at Peninsula, Taylor, Bannan & Harrison, No. 1234 (distributed as *O. pallida*). There is a possibility that this western plant may be found in the nearby Clay Belt as an adventive along the transcontinental railways.

Oenothera perennis L.

NL. sandy roadside through young jack pine – aspen poplar woods. No. 5258; Sen. rivershore thickets, No. 4355; Dup. lake shore, sand and boulders, No. 4143; LWas. grassy clearing in aspen poplar – black spruce forest, old campsite (in anthesis June 29, 1954), No. 5772.

Scarce, on shores, in thickets and clearings. Reported on the Harricanaw R. by Dutilly and Lepage (1952).

Circaea canadensis Hill

LTQ. lakeshore ashwoods (flowers and young fruits July 24, 1953). No. 5274.

Found only once in the L. Timiskaming portion of the Clay Belt where it reaches its northern limit for this longitude.

Circaea alpina L.

VM. clearing in birch woods, former pinery, No. 5942; NL. elm-ash woods on hillside, No. 5205; Tas. black spruce forest on damp rocky hillside, No. 4253; LaS. grazed poplar woods on lake shore (in flower June 28. 1952), No. 2869; Math. ravine, poplar woods, No. 3233.

Occasional throughout the Clay Belt in moist woods and clearings.

HALORAGACEAE

Myriophyllum alterniflorum DC.

Amos, in 2 feet of water, sandy bottom, No. 5467; Dup. shallow bay. No. 4215; Coch. sandy, pot hole lake, No. 3857; Gog. rocky bay in 4 feet of water (with young fruits August 2, 1954), No. 6102.

Frequent and sometimes locally abundant in shallow bays and small sandy lakes.

Myriophyllum exalbescens Fern.

Dup. backwater of river, No. 4174; Coch. in 6 feet of water, lake, No. 6153; Tim. small sandy lake, No. 4060; Hst. in water of marshy ditch (with young fruits August 6, 1952), No. 3848.

Common throughout the Clay Belt in backwaters of rivers, small lakes. and quiet lakes, spreading into marshy ditches.

The Clay Belt lies within the range of *Myriophyllum verticillatum* L. var. *pectinatum* Wallr., which has been collected on the north shore of L. Superior in Sibley Twp. by Taylor, Losee & Bannan, No. 843, and reported from a number of stations on the west coast of James B. by DLD. It is possible that this species will also be found within our region.

Myriophyllum Farwellii Morong

VdO. creek outlet at L. Blouin, No. 5533; Tim. small sandy lake, No. 4632.

Found only at two widely distant stations in the Clay Belt and apparently rare, although it may have been overlooked in mistake for other similar species. Fruiting material lacking. Not reported north of our region.

Myriophyllum tenellum Bigel.

Sen. shallow water of sandy lake, No. 4379; and from same lake (in following year, very low water-levels), stranded on mucky lake shore (in flower August 25, 1953), No. 5531.

Rare, found only in one lake in Louvicourt Twp., 22 miles south of Senneterre, and not reported northward.

HIPPURIDACEAE

Hippuris vulgaris L.

Gog. one foot of water in marsh with *Alisma* and *Menyanthes* (in flower July 24, 1954), No. 5997; LKap. marshy creek outlet, No. 6047; Long. backwater of river, No. 3651.

Scarce in the Clay Belt, in shallow water of rivers and marshes.

ARALIACEAE

Aralia racemosa L.

VM. birch-poplar woods in cut pinery (in anthesis July 19, 1954), No. 5910.

Rare, found only once in second-growth birch-poplar woods in the L. Timiskaming portion of the Clay Belt where it reaches its northern limit for this longitude.

Aralia hispida Vent.

NL. railway embankment through poplar woods, No. 2642; OttR. gravelly river-bank, young birch woods, No. 5868; LAO. eroding clay shore, No. 2861; IF. railway through young jack pine forest on sand (in anthesis July 9, 1953), No. 5034.

Frequent in dry openings throughout our region especially in sandy jack pine forest.

Aralia nudicaulis L.

NL. young poplar woods on limestone ridge (in anthesis June 11, 1952), No. 2446; LAO. lakeshore woods on gravel, No. 2840; Kap. spruce-birch-poplar forest, No. 4983; Hst. thickets on river-bank (with ripe fruit August 3, 1952), No. 3743.

One of the most frequent and abundant plants of the mixed deciduous-coniferous forest of well-drained sites throughout the Clay Belt. Forming the characteristic ground cover of the drier forest with *Aster macrophyllus* and *Cornus canadensis*.

52468-6—14

Hydrocotyle americana L. has been found on the north shore of L. Superior only at Batchawana (Taylor). This species may turn up within the southern margin of the Clay Belt.

Sanicula marilandica L.

VM. lake shore, poplar – red maple woods, No. 5974; LTO. lakeshore cedar woods, No. 5213; Coch. thickets beside rocky rapids, No. 3981; Kap. rivershore woods (with young fruits July 20, 1952), No. 3357; Hst. riverbank thickets, No. 3714.

Frequent throughout our region in thickets and woods along shores of rivers and lakes.

Osmorhiza Claytoni (Michx.) C. B. Clarke

LTO. lakeshore bank (in anthesis June 12, 1952), No. 2506; NL. elm-ash woods on hillside (with ripe fruit July 21, 1953), No. 5202; LKap. abandoned settlement with fireweed and raspberry, No. 6095.

Occasional in moist woods and openings in the L. Timiskaming portion of the Clay Belt, rare elsewhere in our area. Not reported northward.

Osmorhiza longistylis (Torr.) DC.

LTO. lakeshore woods (in anthesis June 12, 1952), No. 2510; Dup. roadside, foot of rocky outcrop (fruit mature August 20, 1952), No. 4133.

Rare, found at two widely distant points in the Clay Belt, and not reported northward.

Osmorhiza obtusa (C. & R.) Fern.

Long. old white spruce forest (fruit mature August 1, 1952), No. 3686.

Found only once at the western end of our area. This species has been collected northward in James B. on Charlton I. by A. E. Porsild, No. 4506.

The Clay Belt lies within the range of *Osmorhiza chilensis* H. & A. (*O. nuda* Torr.; *O. divaricata* (Britt.) Suksd.) as given in Gray's Man. It has been collected along the north shore of L. Superior at Michipicoten by Hosie, Harrison & Hughes, Nos. 2413, 2414, and 2415 and in Sibley Twp. by Taylor, Losee & Bannan, No. 1146. Like the similar *O. obtusa,* it may occur rarely in our area and is worth keeping on the list of possibilities.

Zizia aptera (Gray) Fern.

This species has been collected close to Kapuskasing; small patch in clay soil near railway tracks, Bassett and Mulligan, No. 1932 (DAO). Evidently a rare adventive from the west in our region. Not seen by us and noted only at this location by the collectors.

Cicuta bulbifera L. Bulbous Water Hemlock

Amos, sandy, silted lake shore, No. 5386; Tas. alluvial river shore, No. 4291; Math. silted river shore, No. 5539; Hst. wet clearing, old lumber camp, No. 3824; Long. ditch through jack pine woods (first flowers in anthesis August 1, 1952), No. 3689.

Frequent on silted shores and in very wet clearings, locally abundant on open wet alluvium.

Cicuta maculata L. has been collected north of the Clay Belt at Moose Factory on James B., W. Spreadborough, July 15, 1904; and southward on L. Superior at Rossport, near Schreiber, by Hosie, Losee & Bannan, No. 2193 (revised by H. J. Scoggan from *Sium suave*). Water hemlock will probably be found within our area.

CARUM CARVI L. Caraway

LaS. roadside through marsh (in flower June 29, 1952), No. 2891.

Rarely established as a roadside weed in the Clay Belt. Noted as naturalized around the posts in the southern James B. area by DLD.

Sium suave Walt. Water Parsnip

LAO. wet rivershore thickets, No. 5091; Gog. rivershore marsh among *Equisetum fluviatile,* No. 6013; Kap. shore of small lake (in flower July 24, 1952), No. 3475.

Frequent in wet, open thickets and on shores, locally abundant on marshy alluvium.

PASTINACA SATIVA L. Wild Parsnip

Amos, road through farmland (in flower July 3, 1952), No. 2967; Coch. roadside through farm fields, No. 5180.

Occasionally established on roadsides through the farmlands of the Clay Belt and reported northward (DLD).

Heracleum maximum Bartr.

H. lanatum, New B. & B.

Math. river shore, farmland (in flower and fruit July 17, 1952), No. 3268.

Frequent on open damp shores and spreading like a weed into ditches and wet roadsides.

DAUCUS CAROTA L. Wild Carrot

LTQ. roadside, through clearing (in fruit with last flowers September 10, 1952), No. 4440.

A rare roadside weed in the farmlands of the L. Timiskaming portion of the Clay Belt. Not reported northward.

CORNACEAE

Cornus canadensis L.

NL. roadside through poplar woods (in flower June 11, 1952), No. 2454; LaS. lakeshore poplar-birch woods, No. 2816; Kap. white spruce woods on creek-bank, No. 4999.

One of the most frequent plants of the mixed deciduous-coniferous forest. Forming with *Aster macrophyllus* and *Aralia nudicaulis* the characteristic ground cover of the forest on the better-drained sites.

52468-6—14½

Cornus stolonifera Michx.

NL. young poplar woods on limestone ridge (in anthesis June 11, 1952), No. 2447; IF. thickets in wet black spruce forest, No. 5061; Kap. rivershore woods, No. 3358.

Common throughout the Clay Belt in thickets along shores, wet openings in the forest, and margins of clearings.

Cornus rugosa Lam.

LTQ. clearing on lake shore, No. 4431; NL. sandy road through jack pine woods (flowers in bud June 15, 1952), No. 2626; Hail. river-bank thickets (fruit mature July 31, 1953), No. 5372.

Occasional in thickets on drier shores, in young birch-poplar woods and margins of clearing. Found only in the L. Timiskaming portion of the Clay Belt where this species reaches its northern limit for these longitudes.

Cornus alternifolia L. f. Alternate-leaf Dogwood

VM. roadside poplar woods, tree 18 feet high, 4 inches diameter, No. 4536; NL. young poplar woods (in anthesis June 17, 1952), No. 2700.

Rare in young poplar woods in the L. Timiskaming area where this species also reaches its northern limit.

PYROLACEAE

Chimaphila umbellata (L.) Bart.

LTO. rocky lakeshore woods, No. 4425; Math. sandy bank above bog (flowers in bud July 16, 1952), No. 3225.

These specimens have the relatively thin leaves, definitely veined beneath, of var. *cisatlantica* Blake which is here near its western limit.

Scarce in sandy and rocky woods and openings.

VM. sandy lakeshore woods, No. 4531; Hst. rocky clearing beside river (in anthesis August 4, 1952), No. 3776.

In these collections the leaves are comparatively thick and very obscurely veined beneath, placing them with var. *occidentalis* (Rydb.) Blake, into which var. *cisatlantica* passes according to the New B. & B.

Occurring with the same frequency and habitat preference as var. *cisatlantica*.

Moneses uniflora (L.) Gray

WasR. birch woods, shore of rapids (in anthesis June 30, 1954), No. 5783; Tas. black spruce forest on damp rocky hillside, No. 4254; Dup. black spruce forest, No. 4158; Kap. cedar woods on creek-bank, No. 5002. and spruce poplar woods at falls, No. 3528.

Occasional in damp black spruce forest and in woods beside rapids.

Pyrola secunda L.

LAO. lakeshore birch woods, No. 5134; Marsh. sandy bank above small lake (in flower July 13, 1952), No. 3151; Kap. river-bank woods. No. 3332.

Occasional in moist woods throughout the Clay Belt and more frequent in poorly drained black spruce forest.

LaS. black spruce bog (flowers in bud June 29, 1952), No. 4562.

This collection has the less involute basal bracts and leaf-blades rounded above of var. *obtusata* Turcz., which the New B. & B. regards as merely a small form growing in dense shade.

The variety was collected only once in a black spruce bog.

Pyrola minor L.

WasR. birch woods, shore of rapids (in anthesis June 30, 1954), No. 5782; Amos, lakeshore black spruce woods, No. 4565; Coch. lakeshore woods, No. 3894; Hst. black spruce – cedar woods, No. 3781; Long. sandy lakeshore bank, No. 3613.

Frequent, in a variety of moist woodland habitats throughout the Clay Belt.

Pyrola virens Schweigger

VdO. birch-spruce woods on lake shore, No. 3030; LAO. dry spruce-poplar forest in anthesis June 28, 1952), No. 2856; Long. trail through old jack pine forest, No. 3672.

Scarce, in dry woodlands.

Pyrola elliptica Nutt.

VM. poplar woods on cut pinery, No. 5909; OttR. birch woods, No. 5862; Tas. black spruce forest, lake shore, No. 4267; LAO. aspen poplar woods (first flowers in anthesis July 12, 1953), No. 5080; Math. ravine, poplar woods, No. 3249; Hst. path through black spruce forest, No. 3724.

Frequent throughout our region in a variety of dry to moist woodland habitats.

Pyrola rotundifolia L. var. *americana* (Sweet) Fern. has been reported from Batchawana on L. Superior by Taylor. This species may possibly be found within the southern margin of the Clay Belt.

Pyrola asarifolia Michx.

WasR. birch woods, shore of rapids (first flowers in anthesis June 30, 1954), No. 5781; VdO. lakeshore black spruce woods, No. 3064; Kap. aspen poplar – balsam fir woods, No. 5021; Long. old black spruce woods, No. 3685.

This material has the reniform, cordate, lustrous leaves of the typical variety.

Occasional in moist woods throughout the Clay Belt.

LaS. young poplar-birch woods (first flowers June 25, 1952), No. 2812; Long. black spruce forest, No. 3673.

These specimens have the leaves longer than broad, with more rounded bases, dull on the upper surfaces, and belong to var. *purpurea* (Bunge) Fern.

This variety collected at two widely separate places in moist woods, and evidently not as frequent as the typical variety.

Monotropa uniflora L.

NL. sandy loam in jack pine forest, No. 2612; black spruce forest on damp rocky hillside, No. 4255; Kap. spruce-poplar woods at falls (in flower July 26, 1952), No. 3529; Long. jack pine – black spruce woods, No. 3563.

Occasional throughout our area in old forest with much humus on floor.

Monotropa Hypopithys L.

A single plant was collected near Timmins, in jack pine forest on sandy ground, by F. N. Cowell, July 25, 1952. This species has not been reported north of our area.

ERICACEAE

Ledum groenlandicum Oeder

NL. open sphagnum bog (in flower June 13, 1952), No. 2549.

The most frequent and abundant plant of the wet black spruce forest which is typical of the lowlands of the Clay Belt. Extending into black spruce – larch woods, around boggy lakes and into the open bog, and far into the shade of poorly drained black spruce forest.

Kalmia angustifolia L.

NL. sandy loam in jack pine forest, No. 2613; OttR. open black spruce bog, No. 5823; Amos, sandy opening in jack pine forest (in flower July 1, 1952), No. 2904; IF. open jack pine woods, No. 5051; Coch. sandy jack pine forest, No. 3886; Long. jack pine woods, No. 3693.

A characteristic plant of the sandy jack pine forest, where it forms extensive thickets, and occurring also around bogs.

Kalmia polifolia Wang.

NL. open Labrador tea bog, No. 2564; Amos, floating bog around lake (in flower June 8, 1954), No. 5659; Tim. open bog, No. 4761.

Common in open bogs throughout the Clay Belt.

Andromeda glaucophylla Link

NL. bog with *Chamaedaphne* and *Ledum* (in flower May 29, 1954), No. 5605; Amos, drained bog, No. 2983; Tim. low thicket on margin of boggy lake, No. 4772.

Common throughout the Clay Belt in open bogs, often forming thickets on margins of boggy lakes. The similar northern *A. Polifolia* L. does not occur in our region.

Chamaedaphne calyculata (L.) Moench

LTQ. rocky crevices on open lake shore, No. 4689; Amos, thickets on boggy ground, No. 5683; IF. wet black spruce woods, No. 5056; Tim. low thicket on boggy lake shore, No. 4769; Hst. thickets in rivershore meadow (in anthesis June 2, 1954), No. 5627.

All the Clay Belt material has the short, acute sepals and the narrower leaves with the dimensions of var. *angustifolia* (Ait.) Rehd., as given in Gray's Man. but not mentioned in the New B. & B.

Abundant in open boggy land frequently forming dense thickets, excluding all other plants.

Epigaea repens L.

NL. on sandy loam in jack pine forest, No. 2598; Amos, young spruce-poplar woods on rock knob (in flower June 9, 1954), No. 5681; Tim. young aspen poplar – jack pine woods, No. 4745; Long. jack pine – black spruce woods, No. 3564.

All the Clay Belt specimens have the glabrous or soon glabrate leaves of var. *glabrifolia* Fern.

Frequent in dry woods especially in sandy jack pine forest and on the wooded flanks of rock knobs. Listed by Hustich (1955) in a jack pine stand near Coral Rapids, north of Cochrane, beyond the margin of the Clay Belt.

Gaultheria procumbens L.

LTQ. rocky crevices on open lake shore, No. 4695; LTO. rocky lake shore, young aspen poplar – red pine woods (in flower July 28, 1953), No. 5331; NL. sandy loam in jack pine forest, No. 2610; Sen. sandy bank above lake, No. 4382.

Occasional in the L. Timiskaming portion of the Clay Belt, rare northward and not reported north beyond our region. Occurring in sandy and rocky places in woods and in the open.

Gaultheria hispidula (L.) Bigel.

NL. sandy loam in jack pine forest, No. 2607; Tim. young aspen poplar – black spruce woods (in flower June 11, 1953), No. 4744; Kap. spruce-poplar forest, No. 3526.

One of the most frequent plants of the poorly drained black spruce forest where it forms large trailing mats on the damp humus.

Arctostaphylos Uva-ursi (L.) Spreng.

LTQ. open red pine woods on rocky hillside, No. 4682; VM. sandy bank below red pine stand, No. 5982; Amos, sandy opening in burnt jack pine woods (in flower June 8, 1954), No. 5666; Gog. sandy bank in old pine stand, No. 6002.

These specimens have the tomentulose young twigs of var. *coactilis* Fern. & Macbr.

Locally abundant in open rocky and sandy places in the L. Timiskaming portion of the Clay Belt, rare elsewhere in our area in sandy openings of the jack pine forest and in the few stands of red pine.

LTQ. rocky lake shore, open jack pine woods, No. 5264; Tas. sandy openings in jack pine forest, Nos. 4273 and 5440.

These collections have the spreading glandular hairs of var. *adenotricha* Fern. & Macbr.

Collected less frequently than var. *coactilis* but having the same distribution and habitat preferences.

Vaccinium uliginosum L.

LWas. bouldery river shore (in flower June 26, 1954), No. 5749; LMat. open rocky summit of Mt. Laurier, No. 5806; Tas. open larch bog, No. 4259; Ger. rocky lake shore, No. 6146.

All the Clay Belt collections are from upright shrubs of the typical variety.

Common on rocky shores and exposures in the northern Quebec portion of the Clay Belt and rare elsewhere in our area.

Vaccinium cespitosum Michx.

Sen. rocky river-bank, No. 4342; Dup. on lake shore of boulders and sand, No. 4637; Long. sandy roadside clearing through black spruce forest (fruit ripe July 29, 1952), No. 3575.

Rare, found at three widely distant points in our region, on rocky shores, and in sandy clearing.

Vaccinium ovalifolium Sm. has been collected on L. Superior at Michipicoten by Hosie, Harrison & Hughes, No. 1311. The range of this species possibly extends to the southern margin of the Clay Belt.

Vaccinium myrtilloides Michx.

NL. roadside through open drained bog, No. 4547; Amos, foot of rock knob (in flower June 8, 1954), No. 5673; Arnt. poplar woods on talus, No. 2749; Math. spruce-birch forest on rocky hillside, No. 4824; Tim. boggy opening in jack pine forest, No. 4802.

Common in a wide variety of wooded and open habitats. Occurring most frequently in black spruce forest on flanks of rocky hills.

Vaccinium angustifolium Ait.

VM. clearing in red pine forest (in flower June 7, 1953), No. 4714; NL. roadside through open drained bog, No. 4548, and sandy loam in jack pine forest, No. 2615; LWas. gravelly hillock, No. 5731; Amos, sandy opening in burnt, jack pine woods, No. 5667.

In Nos. 4548 and 5667 the leaves are narrower, suggesting the typical variety, and in the other numbers broader, suggesting var. *laevifolium* House. According to Gray's Man. the typical variety passes southward into var. *laevifolium*. The New B. & B. treats them as separate species, *V. angustifolium* for the diploid plants, and *V. Lamarkii* Camp for the tetraploid derivative, with ranges nearly coincident.

This blueberry is one of the most frequent and abundant plants of the Clay Belt. It occurs in drier woodlands, where it is suppressed and fruits lightly. It grows vigorously in sandy and rocky openings, spreading along trails and into clearings. Following forest fires it forms very extensive patches where it fruits heavily. From these brulés the settlers get a welcome cash crop, which is harvested by family groups and shipped to market in large quantities.

Gog. sandy roadside through young jack pine forest (in fruit July 23, 1954), No. 5991.

This collection has the black fruits of var. *nigrum* (Wood) Dole (*V. Brittonii*, new B. & B.) which has been reported northward on the Harricanaw R. by Dutilly and Lepage (1952).

Vaccinium corymbosum L. has been reported at Batchawana on L. Superior by Taylor. This species may possibly be found within the southern margin of the Clay Belt.

Vaccinium Vitis-Idaea L. var. *minus* Lodd. occurs north and south of the Clay Belt, but we did not see it anywhere within our area. It has been collected many times along the north shore of L. Superior by Hosie, Taylor, *et al.* from Peninsula (No. 815) to Sibley Twp. (No. 649), and might therefore be expected in the Long L. end of the Clay Belt. It occurs on the Moose R. estuary at Moose Factory (Baldwin, Hustich, Kucyniak & Tuomikoski, No. 942), and we therefore searched carefully in the northeastern portion of our area around L. Mattagami but without success.

Oxycoccus quadripetalus Gilib.

Vaccinium Oxycoccos, Gray's Man., New B. & B.

NL. roadside through dwarf birch thickets, No. 5304; OttR. lakeshore cedar woods, No. 5841; Coch. floating sedge bog, No. 5177; IF. on sphagnum in black spruce forest (in flower July 9, 1953), No. 5055; Tim. boggy shore of small lake, No. 4006.

This material has the larger, less revolute leaves of the typical variety in Porsild's treatment (Can. Field-Nat. 52: 116-117, 1938).

One of the most frequent plants of the wet, boggy, black spruce forest of the Clay Belt, occurring also on boggy shores and in thickets.

NL. open sphagnum bog (flowers in bud June 15, 1952), No. 2653; Tas. open sphagnum bog, No. 4282; Arnt. black spruce bog, No. 2760.

These specimens have smaller, strongly revolute leaves which approach var. *microphyllus* (Lange) M. P. Porsild, which is distinct in Greenland and Labrador and merging in the St. Lawrence region according to A. E. Porsild. This material is readily separated from the subarctic *O. microcarpus* Turcz by its pubescent pedicels.

Occasional in open sphagnum bogs.

Oxycoccus macrocarpus (Ait.) Pers.

Vaccinium macrocarpon, Gray's Man., New B. & B.

Tas. forming thicket around boggy lake, No. 4289; LaS. shore of small boggy lake, No. 5897.

Found only at two small boggy lakes in the Quebec portion of the Clay Belt, where it formed dense thickets on the shores. Although listed by J. M. Macoun (1897) for the James B. area, no collection has been found to confirm its occurrence north of the Clay Belt.

PRIMULACEAE

Primula intercedens Fern., whose status is still uncertain (Butters & Abbe, 1953), has been collected at Michipicoten on L. Superior by Hosie, Harrison & Hughes, No. 2051. This material is conspicuously farinose with narrow oblanceolate leaves. It

is possible that similar material will be found northward within the southwestern margin of the Clay Belt. In the New B. & B. this species is included under *P. mistassinica*.

Primula mistassinica Michx.

LWas. boulder lake shore, on rhizomes of *Osmunda regalis* (in flower June 27, 1954), No. 5757; Kap. sandy river shore, cedar woods, No. 4948, and around rocky pools at falls, No. 3538; Long. sandy lakeshore bank, No. 3612.

Scarce in our region, on wet sandy and rocky shores.

Lysimachia terrestris (L.) BSP.

OttR. rocky shore, No. 5847; VdO. marshy river shore (in flower July 10, 1952), No. 3070; LAO. sandy beach at creek outlet, No. 5130; Hst. marshy lake shore, No. 3789.

Frequent on wet shores and in marshes throughout the Clay Belt.

Lysimachia thyrsiflora L.

Naumburgia thyrsiflora, New B. & B.

Amos, marshy river shore (in flower July 3, 1952), No. 2978; Dup. lake shore, silted bay, No. 4119; LAO. sandy, silted lake shore, No. 5140; Hst. marshy river shore, No. 3773.

Occasional on marshy shores and silted bays.

Lysimachia ciliata L.

Steironema ciliatum, New B. & B.

LTQ. lakeshore ashwoods, No. 4487; LTO. lake shore, margin of cedar woods (in flower July 21, 1953), No. 5216; Dup. lakeshore boulders and sand, No. 4142.

Occasional on shores and in wet shore woods. Reported northward at Moose Factory by DLD.

Trientalis borealis Raf.

VM. balsam fir–aspen poplar woods (in flower June 8, 1953), No. 4725; NL. young birch-poplar woods on limestone ridge, No. 2479; and thickets on sandy shore of small lake, No. 2624; LWas. black spruce forest, No. 5739.

A typical plant of the poorly drained black spruce forest of the Clay Belt, also common on drier sites in mixed coniferous-deciduous woods, and occurring in shore thickets.

OLEACEAE

The northern limit of the range of *Fraxinus americana* L. as mapped in "Native Trees of Canada" (1949) comes close to the L. Timiskaming portion of the Clay Belt. White ash has been reported at Batchawana on L. Superior by Taylor. There is a possibility that outlying trees may be found within the southern margin of our region.

Fraxinus pennsylvanica Marsh. Northern Red Ash; Green Ash

VM. lake shore, No. 4517; LTQ. lakeshore woods, No. 4495; NL. low river-bank (fruit mature July 29, 1953), No. 5337.

In No. 5337 the fruits have spatulate wings and are small, within the dimensions of var. *Austini* Fern. The other numbers lack fruit, which we saw but rarely on the northern red ash of the Clay Belt. The leaflets in all specimens are toothed. The two sterile specimens were revised to var. *Austini* by H. J. Scoggan.

Occasional in low woods on the shores of lakes and rivers in the L. Timiskaming portion of the Clay Belt.

LTQ. lakeshore clearing (with fruit September 10, 1952), No. 4444, and lakeshore woods, No. 4480; LTO. elm-ash – balsam poplar woods on lake shore (in anthesis May 28, 1954), No. 5580.

This green ash material, var. *subintegerrima* (Vahl) Fern., is readily distinguished from red ash by its glabrous branchlets and petioles.

Green ash, like the northern red ash, is limited to the L. Timiskaming portion of the Clay Belt and is a little more frequent in low shore woods.

Fraxinus nigra Marsh. Black Ash

LTQ. lakeshore clearing, No. 4441; LTO. damp elm-ash woods, No. 2533; LWas. low lake shore, alder thicket, No. 5754; Dup. low wet woods (fruit mature August 22, 1952), No. 4193; Tim. rivershore woods, No. 4020; Hst. wet low lake shore, No. 3735.

Occasional on low, wet shores up to the northern margin of the Clay Belt and beyond up to lat. 51° 50′ N., the northern limit for these longitudes according to McInnes (1909). Usually a small tree, it sometimes (No. 4193) grows 40 feet high and to 12 inches in diameter. On larger alluvial areas it forms a characteristic wet woodland community with white elm.

GENTIANACEAE

The range of the circumboreal species *Gentiana Amarella* L. comes close to the Clay Belt, although we did not find it. The nearest collections are northward at Renison on the Moose R. by Hustich & Tuomikoski, No. 3, and westward at the Lake of the Woods by John Macoun, July 28, 1872. It is probable that this species will be found within the margin of our area. A similar possibility exists for two more species, collected at Renison by Hustich & Tuomikoski: *G. crinita* Froel., No. 109; and *G. gaspensis* Vict., No. 24 (a revision by Louis-Marie of material distributed as *G. Macounii* Holm.)

Gentiana nesophila Holm and *G. Macounii* Holm have been collected north of our area in James B., but there are no records sufficiently far south to suggest that they extend to our region. *G. procera* Holm, with stations on the Great Lakes, does not closely approach our region from the south.

Gentiana rubricaulis Schwein.

Coch. wet clearing on lake shore, No. 6162; Tim. sedge meadow around bog, No. 4064; Kap. lakeshore alder thicket under balsam poplar (in flower August 8, 1954), No. 6119.

Rare, in wet shore habitats. This species extends north of the Clay Belt on the Moose R. at Renison where it was collected by Hustich & Tuomikoski, August 28, 1947.

Gentiana linearis Froel.

Sen. wet sandy lake shore, No. 4341, rivershore thickets, No. 4349, shore of small boggy lake, No. 4394; VdO. spring bank above lake shore, (in flower August 18, 1953), No. 5506; Coch. wet clearing on lake shore, No. 6170.

Scarce, in wet shore habitats. Like *G. rubricaulis* this species extends north of the Clay Belt, having been collected on James B. at Eastmain by A. H. D. Ross, 1892.

Halenia deflexa (Sm.) Griseb.

VM. lakeshore woods, No. 4530; LTO. lakeshore cedar woods, No. 5214; Hst. thickets on river-bank, No. 3744; Kap. rivershore thickets (in flower July 20, 1952), No. 3316.

Occasional in low shore woods and thickets.

Menyanthes trifoliata L.

Arnt. wet place behind shore (past flowering June 21, 1952), No. 2787; LAO. marshy creek-outlet, No. 5155.

Occasional throughout the Clay Belt in shallow water of marshes and on very wet, mucky shores.

Nymphoides cordata (Ell.) Fern.

OttR. floating off rocky shore of island, No. 5844.

This collection was taken from a tangle of leaves floating free in deep water. We could find neither fruiting material nor the rhizomes from which they had been separated. The shape, venation, and texture of the leaves place them certainly with this species, and not with the similar leaves of *Nuphar microphyllum*.

Rare, found only once at the southeastern end of the Clay Belt, south of the height of land in the upper Ottawa River drainage system. Not reported northward.

APOCYNACEAE

Apocynum androsaemifolium L.

OttR. clearing around old camp, No. 5861; Amos, railway through poplar woods (in flower July 5, 1952), No. 3015; LAO. lakeshore clearing, No. 5070; Math. sandy clearing, No. 3229.

Occasionally locally abundant in dry clearings and sandy openings in the forest.

Apocynum medium Greene

Dup. roadside, foot of rocky outcrop (with late flowers and no fruits August 20, 1952), No. 4138.

This puzzling material has some of the characters of both *A. androsaemifolium* and *A. sibiricum*. It seems best to refer it to *A. medium* following the treatment of Gray's Man. This species is listed in southern Ontario (Soper, 1949) but not north of our area.

Apocynum sibiricum Jacq.

LTQ. open, rocky shore (in fruit September 11, 1952), No. 4471; LTO. sandy shingle beach, No. 5232; Dup. lake shore of boulders and sand, No. 4146; Kap. clearing on rocky river shore (in flower July 20, 1952), No. 3336.

Scarce in the Clay Belt, on open rocky and sandy shores.

CONVOLVULACEAE

Convolvulus spithamaeus L. has been collected on L. Superior at Peninsula by Taylor, Bannan & Harrison, No. 446. This species possibly will be found within the southern margin of our area.

Convolvulus sepium L. Hedge Bindweed

LTQ. creek-bank, farm pasture, No. 4399; VM. birch-maple woods on lake shore (in flower July 20, 1954), No. 5950.

The flowers on No. 5950 are roseate, placing it with forma *coloratus* Lange, which is the more common form according to Gray's Man. The other collection is past flowering.

Rare in the L. Timiskaming portion of the Clay Belt but collected northward at Renison on the Moose R. by Hustich & Tuomikoski, No. 112.

The field bindweed, Convolvulus arvensis L., was collected at Peninsula by Taylor, Bannan & Harrison, No. 447. This weed may be expected within our region.

POLEMONIACEAE

Collomia linearis Nutt.

Kap. railroad ballast (in flower July 24, 1952), No. 3488; Long. railway yards, No. 4614.

Rare, occurring in the Clay Belt only as an adventive along railways, and not reported northward.

HYDROPHYLLACEAE

Phacelia Franklinii (R.Br.) Gray was collected on L. Superior at Rossport, near Schreiber, by Hosie, Losee & Bannan, No. 1391. This species possibly will be found nearby within the southwestern margin of the Clay Belt.

BORAGINACEAE

Echium vulgare L. Blue Weed

VM. clearing, No. 4513, and sandy clearing in birch woods, former pinery (in flower July 19, 1954), No. 5912.

A rare weed in dry clearings in the farmlands around L. Timiskaming. Collected north of this near Kirkland L., Ontario, by Mulligan & Bassett, No. 803 (DAO). This station is probably on the tongue of land, not submerged by glacial Lake Barlow-Ojibway between the L. Timiskaming and the northern portions of the Clay Belt. Not reported northward beyond that station.

LITHOSPERMUM OFFICINALE L. Common Gromwell

LTQ. clearing on lake shore, No. 4434, and lake shore balsam poplar woods, No. 5279; VM. sandy clearing in birch woods, former pinery (in fruit July 19, 1954), No. 5916.

An occasional weed in clearings, on open shores and in disturbed woods. Found only in the L. Timiskaming portion of the Clay Belt, and not reported northward.

CYNOGLOSSUM OFFICINALE L. was reported at Batchawana on L. Superior by Taylor. Hound's tongue was mentioned by Kirkconnell (1919) as occurring at Kapuskasing, but this may be a misidentification of LAPPULA ECHINATA, which certainly is present in our area. It is possible, however, that this weed may be found within our region.

Cynoglossum boreale Fern.

LTQ. aspen poplar – birch woods (in anthesis June 6, 1953), No. 4700; LTO. lakeshore cedar woods, No. 5266; NL. roadside through young poplar woods, No. 2462 (det. A. E. Porsild).

Occasional in a variety of woodland habitats and found only in the L. Timiskaming portion of the Clay Belt, which is its northern limit in this longitude.

MYOSOTIS SCORPIOIDES L.

Coch. silted shore of Commando L. (in late flowering August 12, 1952), No. 3935.

Rare, found only at Cochrane on wet shore of town park where a large colony had become naturalized. Not reported northward.

Myosotis laxa Lehm.

Amos, abandoned canal bank (in late flowering August 9, 1953), No. 5446.

Rare, collected in a long disused canal of an abandoned mining operation. Not reported north of our area.

MYOSOTIS SYLVATICA Hoffm.

The garden forget-me-not was collected near Hearst on moist clay soil by Bassett & Bragg, No. 1272 (DAO., det. G. A. Mulligan). The collectors noted only a few scattered plants. Not reported northward.

Mertensia paniculata (Ait.) G. Don

NL. bank of creek through spruce-poplar woods (first flowers June 13, 1952), No. 2536; LMat. creek-side in black spruce forest, No. 5798; Amos, trail through white spruce woods, No. 2932; LaS. thickets below rock outcrop, No. 2875; IF. clearing in aspen poplar woods, heavy clay, No. 4783; Long. rivershore thickets, No. 3680.

A characteristic plant of our region common on creek-banks, shores, thickets, margins of clearings and along forest roads. The Quebec collections from our area are from the southeastern limit of the range of this species.

LAPPULA ECHINATA Gilib. Blue Bur

VM. sandy clearing in birch woods, former pinery (flowers with immature nutlets July 19, 1954), No. 5931; LTO. clearing on shingle lake

shore, No. 5209; Math. clearing around old camp, No. 3159; Kap. river-bank at town park, No. 3496.

An occasional weed of clearings, roadsides, and waste places, more frequent in the L. Timiskaming portion of the Clay Belt. Reported northward at the Moosonee railhead by DLD.

Hackelia americana (Gray) Fern. has been collected at several places on L. Superior, the nearest being Nipigon, near Schreiber, by Hosie, Losee & Bannan, No. 532 (distributed as *H. deflexa* var. *americana*). This species will probably be found northward in the nearby Clay Belt.

VERBENACEAE

Verbena hastata L.

Kap. railway embankment (first flowers in anthesis July 20, 1952), No. 3356.

Seen only at one place in the Clay Belt, occurring on a railway embankment like an adventive. Not reported north of our region.

LABIATAE

Scutellaria lateriflora L.

OttR. gravelly river shore under birch woods (first flowers July 15, 1954), No. 5866; VdO. muddy river-bank, No. 5516; Coch. river shore below bank, No. 3965; Kap. woods on river-bank, No. 3368.

Occasional throughout our area on river shores, banks, and in wet open woods.

Scutellaria epilobiifolia A. Hamilton

S. galericulata, New B. & B.

Amos, roadside through poplar woods (in flower July 5, 1952), No. 3017, and sandy lake shore, No. 5393; LaS. floating margin of cat-tail marsh, No. 5875; LAO. wet rivershore clearing, No. 5097; Math. marshy shore of small lake, No. 3196.

Frequent on wet shores and in marshes, wet clearings, and ditches.

Agastache Foeniculum (Pursh) Ktze.

VM. clearing at dam, No. 4503; NL. railway ditch through poplar woods, No. 2643; Kap. clearing around small lake (in flower July 22, 1952), No. 3422.

Scarce in the Clay Belt and only in clearings where it is probably adventive from the west. Not reported northward.

Nepeta Cataria L.

VM. sandy roadside through field (in flower July 19, 1954), No. 5939; LTO. clearing on lake shore, No. 5240.

A rare weed of roadside and clearing. Not seen north of the L. Timiskaming portion of the Clay Belt.

GLECHOMA HEDERACEA L.

NL. grassy roadside through village (in flower May 29, 1954), No. 5612; Amos, young poplar woods near cottages, No. 5664.

This material has the small flowers (less than 15 mm. long) of var. MICRANTHA, which Gray's Man. notes as usually more common than the typical variety. The New B. & B. remarks that the two races (the typical form and var. *parviflora*) may not merit varietal rank.

Rare, found only twice in the Clay Belt near settlements. Not reported northward.

Dracocephalum parviflorum Nutt. American Dragonhead

Moldavica parviflora, New B. & B.

Kap. sandy pit in spruce forest (in flower July 4, 1953), No. 5006, and lakeshore clearing, No. 4603.

This was also collected about 25 miles northeast of L. Timiskaming at Rivière-Solitaire, by Marie-Victorin, Rolland-Germain & Meilleur, No. 43,929.

Rare in dry clearings in the Clay Belt.

Prunella vulgaris L. Heal-all

VM. gravelly roadside through birch-maple woods, No. 5971; BellR. open rocky crevices beside rapids (in flower July 6, 1954), No. 5812; LaS. road to pasture, No. 2893; LAO. crevices in rocks at rapids, No. 5172; IF. grassy clearing on clay lake shore, No. 5039; Math. marshy river shore, No. 3266.

Nos. 5039 and 5172 have been revised to forma *iodocalyx* Fern. by H. J. Scoggan.

Common throughout the Clay Belt on shores, in damp openings, clearings, pastures, and roadsides.

Our material is referred to the indigenous var. *lanceolata* (Bart.) Fern. The New B. & B. remarks that it is often impossible to assign a plant satisfactorily to the varieties of this circumboreal species. Our collections from the settled areas may include the typical variety naturalized from the Old World.

GALEOPSIS TETRAHIT L. Hemp Nettle

OttR. rivershore clearing, No. 5856; Amos, roadside ditch through farmland, No. 5453; Math. clearing around old camp (in flower July 13, 1952), No. 3155.

This material has the small, purplish flowers and cuneate leaf bases of the var. BIFIDA (Boenn.) Lej. & Court.

VM. sandy clearing in birch woods, former pinery, No. 5921; LTQ. lakeshore cedar woods, No. 5263.

These collections have the white flowers of forma ALBIFLORA House, which was found less frequently than the purple-flowered form.

Hemp nettle is a frequent weed of clearings, roadsides, and openings in the forest, and occurs northward beyond our area.

Stachys palustris L.

VM. grassy, clay shore of Lac des Quinze, No. 5966; LTQ. lakeshore ashwoods, No. 5275, and bank of creek, No. 4406; Coch. rivershore thickets, No. 3958; Kap. waste land at rocky falls (in flower July 20, 1952), No. 3349; Hst. creek-bank, alder thicket, No. 6130.

The Clay Belt material of this shows much variation in the shape and texture of the leaves and in the pubescence of the stem. In all collections the calyx is long-hirsute, and the plants are evidently indigenous. In most specimens the pubescence of the angles of the stem is many times longer than that of the sides, and these have been referred to var. *nipigonensis* Jennings, which is maintained in Gray's Man. but not in the New B. & B. In No. 3349 the pubescence is very dense and equally long on angles and sides. No. 3958 is somewhat intermediate. H. J. Scoggan has revised Nos. 3349 and 3958 to var. *homotricha* Fern.

Occasional throughout the Clay Belt on creek-banks; in thickets, low-shore woods, and wet clearings.

Monarda fistulosa L. has been collected on railway embankments near Peninsula on L. Superior by Taylor, Bannan & Harrison, No. 1076. It is possible that this species will be found adventive northward in the Clay Belt.

Satureja vulgaris (L.) Fritsch

VM. clearing in birch woods, former pinery (in flower July 19, 1954), No. 5914, and clearing, No. 4511; LTQ. rocky lake shore, open poplar woods, No. 5267.

Occasional in open rocky woods and dry clearings of the L. Timiskaming portion of the Clay Belt where this native var. *neogaea* Fern. reaches its northern limit for these longitudes.

Lycopus uniflorus Michx.

VdO. muddy river-bank, No. 5517; Amos, silted lake shore, No. 5387; Tas. alluvial river shore, No. 4310; Math. sedge meadow on silt, No. 3135; Kap. shore of small lake (in flower July 24, 1952), No. 4608; Hst. clearing at old lumber camp, No. 4620.

Frequent throughout the Clay Belt on silted shores and marshy clearings.

Lycopus americanus Muhl.

Tas. alluvial river shore, No. 4309; Coch. alder thickets, No. 5189; Kap. river shore at creek outlet (in flower July 20, 1952), No. 4601; Long. river shore, No. 4616.

Occasional throughout our region on silted shores and alder thickets.

Mentha arvensis L.

LAO. sandy beach at creek outlet (in flower July 15, 1953), No. 5131, and rocky islets, No. 5119; Math. ravine poplar woods, No. 3248; Kap. path beside marshy creek, No. 3351, and boggy clearing beside stream, No. 3416; Long. silted shore, No. 3618.

Our material has the leaf characters of var. *villosa* (Benth.) S. R. Stewart. In Nos. 3351, 3618, and (revised H. J. Scoggan) 5131 the leaves

are glabrescent, and the stem is only minutely pubescent on the angles, placing them with forma *glabrata* (Benth.) S. R. Stewart in the treatment of Gray's Man.

Common throughout our area on shores; in wet openings, clearings, and damp deciduous woods.

SOLANACEAE

Potato (SOLANUM TUBEROSUM L.) is commonly cultivated in the Clay Belt with about 6,000 acres of crop. The acreage in Quebec is reported to be about twice that in the Ontario portion of the Clay Belt. Sprouting tubers were seen on garbage dumps but not persisting.

Chamaesaracha grandiflora (Hook.) Fern.

Physalis grandiflora, New B. & B.

VM. sandy clearing in birch woods, former pinery, No. 5927; LTO. gravel bank on lake shore (in flower June 12, 1952), No. 2520; Tim. sandy roadside clearing, No. 4079.

Rare, in dry openings and clearings. Not reported north of our region.

SCROPHULARIACEAE

VERBASCUM THAPSUS L.

NL. thin soil on limestone ridge (last flowers July 21, 1953), No. 5194: Kap. roadside clearing, No. 3500.

An occasional weed of dry clearings, roadsides, and rocky openings in the L. Timiskaming portion of the Clay Belt, scarce northward and not reported beyond our area.

LINARIA VULGARIS Hill Toadflax

NL. railway yards in town, No. 5360; Tas. roadside clearing at shore, No. 4248; Kap. railroad ballast (in flower July 24, 1952), No. 3486.

Scarce, a weed of railways and roadsides, where it has established large and vigorous colonies in a few places. Not reported northward.

The broad-leaved toadflax, LINARIA DALMATICA (L.) Mill., has been collected on L. Superior at Michipicoten by Hosie, Harrison & Hughes, No. 2370. This weed may occur a little northward in the Clay Belt. Frankton (1955) remarks that there have been a surprising number of reports of this plant in recent years in Canada, particularly from Saskatchewan.

CHAENORRHINUM MINUS (L.) Lange

NL. railway yards in town, No. 5348; Coch. railway tracks (flowers and young fruits July 19, 1952), No. 3388; Kap. railroad ballast, No. 3487.

An occasional railway weed in our area, forming large colonies on cinders between the tracks. Reported northward at the Moosonee railhead by DLD.

COLLINSIA PARVIFLORA Dougl. has been collected on L. Superior in Sibley Twp. by Taylor, Losee & Bannan, No. 1197. This western plant possibly will be found as an adventive in the Clay Belt.

Scrophularia lanceolata Pursh

This species was collected at Haileybury near railway station, clay soil (in flower June 26, 1950) by Bassett & Bragg, No. 1236 (DAO). The collectors noted a few scattered plants. Not seen by us, nor reported north of the L. Timiskaming portion of the Clay Belt where this species probably reaches its northern limit for this longitude.

Chelone glabra L.

VdO. springy bank above lake shore, No. 5507; Coch. river shore below steep bank, No. 3960; Kap. alder thicket on lake shore (in flower August 8, 1954), No. 6117.

In these specimens the lanceolate, glabrous leaves decrease in size from the median to the upper pair as in the typical variety.

Amos, alder thicket beside creek, No. 5501; Math. river shore, No. 3253.

In these specimens the upper pairs of leaves are scarcely reduced placing them with var. *dilatata* Fern. & Wieg.

This species and its variety occur occasionally in our area on damp shores and alder thickets. Collected northward in the Moose R. estuary by DLD.

Mimulus ringens L.

Coch. gravel river bar, No. 5191; Math. road embankment at bridge (in flower July 17, 1952), No. 3262; Gog. rocky shore of rapids, No. 6037.

Occasional on river shores and bars, and in wet clearings. Reported northward in the James B. area by J. M. Macoun (1897).

Mimulus glabratus HBK.

Math. sedge meadow on silt, No. 4580, and from the same place flooded in the following year by a beaver dam (with flowers and young fruits September 2, 1953), No. 5538.

Rare, found only on the silted shore of one small lake. Not reported north of our region. Our material is the North American var. *Fremontii* (Benth.) Grant.

VERONICA SERPYLLIFOLIA L.

Tim. wet lakeshore clearing (in flower June 13, 1953), No. 4774.

We found this species only once in our area, on a wet clearing, where it was well established, probably coming in from nearby tourist camps. It was noted as common a few miles away at South Porcupine by Bragg & Bassett, No. 41 (DAO). Not reported northward.

Veronica tenella All.

V. *serpyllifolia* var. *humifusa*, New B. & B.

LAO. wet rivershore clearing, No. 5092; IF. trail in young aspen poplar – spruce woods (in flower June 15, 1953), No. 4785.

This native species, so similar to the introduced V. SERPYLLIFOLIA, was collected twice in the Clay Belt in wet clearings. Listed northward near James B. (as *V. humifusa*) by Potter (1934).

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Veronica scutellata L.

LMat. silted shore of bay, No. 5792; VdO. muddy river-bank, No. 5519; Amos, trail through white spruce forest, No. 2936; LKap. rocky crevices on river-bank, No. 6065; Kap. muddy creek shore, No. 6109.

The plants of the above series are glabrous and belong to the typical variety.

Arnt. sandy river shore (in flower June 21, 1952), No. 2766; LAO. marshy river shore through alder thicket, No. 5163; Hst. silted lake shore, No. 3784.

In Nos. 5163 and 3784 the stems and leaves of all the plants are villous, as in var. *villosa* Schumacher in the treatment of Gray's Man. No. 2766 is a mixture of the typical and the variety growing together.

This species and its variety are common on wet shores throughout our region on sand, silt, in rocky crevices and in wet openings in the forest.

Veronica americana (Raf.) Schwein.

LL. lake shore (in flower June 22, 1952), No. 2799; Math. thickets around lake, No. 3130; Kap. silted shore of creek, No. 6113.

Occasional on silted shores and in wet thickets.

Veronica peregrina L.

LAO. rocky islets (flowers and young fruits July 15, 1953), No. 5115.

In this material the stems are glandular-pubescent placing it with var. *xalapensis* (HBK.) St. John & Warren.

Found only once in a rare habitat in L. Abitibi on open rocky islets where cormorants and gulls had nested. Reported northward on gull roosts in the Albany R. by DLD.

Castilleja septentrionalis Lindl. has been collected at several stations on L. Superior, the closest to our area being Rossport near Schreiber, Hosie, Losee & Bannan, No. 2153. The nearest collection northward is from Moosonee; Baldwin, No. 1457. This species may be expected within the margins of the Clay Belt.

Orthocarpus luteus Nutt. was collected on L. Superior at Peninsula by Taylor, Bannan & Harrison, No. 1713. It is possible that this western plant will be found within our region as an adventive.

Melampyrum lineare Desr.

NL. rocky outcrop in young birch-poplar woods, No. 5250; OttR. red pine stand on river-bank, No. 5874; Amos, on sandy floor of poplar-birch woods (in flower July 5, 1952), No. 4571; IF. jack pine – birch woods, No. 5049; Tim. aspen poplar – spruce woods, No. 4847.

All the mature collections from the Clay Belt have the bushy-branched stem, bracteal leaves sharply toothed at base, and foliage leaves linear to lanceolate, within the dimensions of var. *americanum* (Michx.) Beauverd in the treatment of Gray's Man.

Common throughout our area in dry woods, occurring in large colonies on sandy and rocky floors of second-growth poplar-birch forest and in pine woods.

Euphrasia hudsoniana Fern. & Wieg.

Coch. open rocky shore (in flower August 12, 1952), No. 3949.

In this very large collection the pubescent bracts have bristle-tipped teeth and, in the larger plants, the branching is fastigiate. In the light of the discussion of northeastern Minnesota material in Butters and Abbe (1953), the Clay Belt plants are *E. hudsoniana,* not the smaller-flowered *E. subarctica,* which the smaller unbranched specimens at first suggested.

Rare, found only once on an open rocky river shore, which is an infrequent habitat in the Clay Belt.

Rhinanthus Crista-galli L.

Hst. clearing on river-bank (in fruit with a few late flowers August 3, 1952), No. 3719.

Rare, found only in a clearing on the bank of the Nagagami R. Gray's Man. notes this species as indigenous northward and naturalized southward, to which the New B. & B. adds that the plants of roadsides and waste places from Newfoundland to northern New York are introduced from Europe.

Pedicularis canadensis L. was mentioned by Kirkconnell (1919) as occurring at Kapuskasing, but we did not see it, nor was it collected on the north shore of L. Superior by Taylor, Hosie, *et al.* The Clay Belt probably has no species of *Pedicularis* and lies in a space between the areas of the southern *P. canadensis* and *P. lanceolata,* and the northern *P. groenlandica, P. parviflora,* etc.

LENTIBULARIACEAE

Utricularia vulgaris L.

VM. 3 feet of water off cat-tail marsh, No. 5944; Dup. marshy creek outlet, No. 4190; LAO. lagoon behind sandbar (in flower July 15, 1953), No. 5142; Kap. small sandy lake, No. 3470.

Common throughout the Clay Belt in stagnant and quiet waters.

Utricularia minor L.

Tas. small boggy lake, No. 4287; Dup. pool in wet black spruce forest, No. 4161; Coch. opening in floating bog, No. 3976.

Occasional in openings in floating bogs and small boggy lakes. No plants were seen in flower.

Utricularia intermedia Hayne

Coch. opening in floating bog, No. 3975; Math. pool in marshy shore, No. 3166; Kap. open water in sedge marsh (in flower June 28, 1953), No. 4937.

Frequent in shallow water of marshy shores, sedge marshes, and bogs.

Utricularia cornuta Michx.

Tas. silted shore of quiet bay, No. 5436; Math. sedge marsh on silt (in flower July 13, 1952), No. 3121; Long. open silted shore, No. 3627.

Occurring on silted shores of a few small lakes and locally abundant. There are no reports of this species north of the Clay Belt.

Utricularia resupinata B. D. Greene has been collected very close to the L. Timiskaming portion of the Clay Belt in the Temagami Forest Reserve by W. R. Watson, No. 453. It probably will be found within the southern margin of our area.

Pinguicula vulgaris L.

Kap. on white cedar roots, sandy river shore (in flower June 30, 1953), No. 4947.

Rare, found only once on the shore of the Kapuskasing R. in Shanly Twp. about 26 miles southwest of the town.

PLANTAGINACEAE

PLANTAGO MAJOR L. Common Plantain

Hail. sandy river shore, No. 5365; NL. sandy road through jack pine forest, No. 2622; Tas. embankment to bridge, No. 4306; Dup. lake shore, sand and boulders, No. 4152, and foot of rocky outcrop, No. 4139; Coch. gravel river bar (in fruit with youngest scape in anthesis July 19, 1953), No. 5192; LKap. sandy lake shore, No. 6070.

The Clay Belt material shows much variation in many features so that it is difficult to decide between the introduced typical form and the native var. *Pilgeri* Domin (var. *asiatica* of Gray's Manual, ed. 7). Those growing as a roadside weed (e.g. No. 4306) are probably introduced, and the glabrous-leaved No. 5192 growing on a river bar (and most other collections from shores remote from settlement) is probably the indigenous var. *Pilgeri*. Collections from the north shore of L. Superior by Taylor, Hosie, *et al.*, labelled as the more southern species, *P. Rugelii*, are all *P. major* and the var. *Pilgeri*.

A common weed of roadsides, waste places, and lawns, occurring (var. *Pilgeri*) on open shores, in clearings in the forest, and north beyond our region.

PLANTAGO LANCEOLATA L. English Plantain

Kap. path on river-bank (in flower July 26, 1952), No. 3509.

A rare weed in the Clay Belt and not reported northward.

RUBIACEAE

Galium Aparine L. has been reported north of the Clay Belt at Moose R. by Potter (1934) and southward at Batchawana by Taylor (1938). The latter collection is the only record of this species by the Taylor and Hosie parties in their five seasons of collecting on L. Superior. This species may possibly turn up in our area.

Galium triflorum Michx.

VM. sandy clearing in birch woods, former pinery, No. 5920; NL. elm-ash woods on hillside, No. 5204; WasR. aspen poplar–birch woods, lake shore (in anthesis July 3, 1954), No. 5785; Amos, lakeshore thickets, No. 5406; LAO. alder-birch woods, No. 5165; Math. ravine, poplar woods, No. 3235.

Common throughout the Clay Belt in deciduous woods and shore thickets.

Galium kamtschaticum Steller was collected once on L. Superior at Batchawana (Taylor), and there is a possibility that it may be found in the Clay Belt.

Galium boreale L.

LL. clearing on lake shore, No. 2796; Math. grassy clearing (fruits and late flowers July 17, 1952), No. 3246; Hst. river shore, No. 4617; Long. ditch through jack pine forest, No. 3692.

This series and all other Clay Belt collections have fruits villous-hirsute with long hairs as in the typical variety.

Occasional on river shores, clearings, and in ditches.

Galium palustre L.

NL. roadside ditch through alder thicket, No. 5309; Coch. sedge meadow around small lake (in anthesis July 10, 1953), No. 5064, and silted shore of Commando L., No. 3932.

Scarce, locally abundant in lakeshore sedge meadow, on silted shore, and in wet ditches. Not reported north of our region.

Galium trifidum L.

LaS. floating margin of cat-tail marsh, No. 5884; Arnt. willow-alder thicket (first flowers June 21, 1952), No. 2770; Kap. winter road on Shanly Creek flood-plain, No. 4975.

Collected at three widely separate points in the Clay Belt. Probably less frequent than the similar *G. tinctorium*, from which it was not certainly separated in the field. Occurring in very wet places.

Galium tinctorium L.

LMat. aspen poplar woods, No. 5793; Sen. roadside through black spruce forest, No. 4373; Amos, creek-bank (first flowers July 4, 1952), No. 2989; LAO. sandy beach, No. 5125; Kap. shore of small lake, No. 3449.

Common in wet places throughout our region occurring on shores and creek-banks, and in thickets, woods, and ditches.

Galium labradoricum Wieg.

Sen. roadside bog, No. 4359; LaS. highway ditch through sedge marsh (first flowers June 27, 1952), No. 2828; Kap. winter road through old black spruce woods, No. 4966; Hst. boggy shore of small lake, No. 3830.

Frequent in boggy places, sedge marshes, and openings in wet black spruce forest.

Galium asprellum Michx.

Amos, roadside ditch through farmland, No. 5452; Math. ravine, poplar woods (first flowers July 17, 1952), No. 3238; Gog. rocky creek-bank, No. 6016.

Occasional in damp woods, creek-banks, and ditches throughout our area.

Mitchella repens L. was reported on L. Superior at Batchawana (Taylor). This species may possibly occur within the southern margin of the Clay Belt.

CAPRIFOLIACEAE

Diervilla Lonicera Mill.

VdO. roadside through birch-spruce woods, No. 3029; BellR. portage trail through birch woods, No. 5816; Tim. old aspen poplar–balsam fir woods, No. 4845; Kap. aspen poplar woods (in flower July 5, 1953), No. 5023.

Common throughout the Clay Belt in deciduous woods on dry sites, openings, river-banks, and dry open shores, clearings, and along trails. In the second-growth poplar woods, it often forms an important shrub layer.

Lonicera villosa (Michx.) R. & S.

NL. *Chamaedaphne* thicket (in flower May 29, 1954), No. 5597, and black spruce–larch bog, No. 2558; LWas. grassy clearing in aspen poplar–black spruce forest, No. 5780; Tas. open black spruce bog, No. 5690; Hst. thickets in rivershore meadow, No. 5628.

The above collections all have the young branchlets both puberulent and hirsute as in var. *Solonis* (Eat.) Fern.

Frequent around open bogs, in thickets and clearings.

LWas. bouldery river shore in *Myrica-Spiraea* thicket, No. 5750; Kap. *Ledum-Chamaedaphne* bog, No. 4990.

These specimens have the young branchlets merely puberulent as in var. *calvescens* (Fern. & Wieg.) Fern.

Collected less frequently than var. *Solonis* but growing in the same sort of habitats.

A specimen with densely villous-subtomentose leaf-surfaces, distributed as the typical variety, was collected within our area 210 miles north of Mont Laurier, tourbière égouttée, Victorin, Germain & Blain, No. 329.

LONICERA TATARICA L.

LTQ. creek-bank, farm pasture (in fruit September 10, 1952), No. 4401.

Rarely escaping from cultivation in the Clay Belt. Not reported northward.

Lonicera canadensis Bartr.

LTO. young aspen poplar–birch woods (in flower May 27, 1954), No. 5571; LAO. spruce-poplar forest, No. 2850; Kap. ravine, white spruce woods, No. 5017; Hst. rivershore woods, No. 3841.

Frequent in well-drained woods and on river-banks. Observed by Hustich (1955) northward on the Moose R.

Lonicera oblongifolia (Goldie) Hook.

NL. black spruce-larch bog, No. 2556; LaS. black spruce bog, No. 2878; Math. margin of flood meadow below falls, No. 4584; Kap. lakeshore thickets (in flower June 24, 1953), No. 4866.

Occasional in boggy black spruce forest and wet thickets. Reported northward as far as Albany by DLD.

Lonicera involucrata (Richards.) Banks

Tas. open black spruce bog, No. 5704; Kap. lakeshore thickets, No. 4863; Hst. young poplar-spruce woods river-bank (in flower June 5, 1954), No. 5654; Long. old white spruce forest, No. 4615.

A characteristic plant of our region occurring occasionally in a wide variety of habitats from open bog, usually in thickets on shores of lakes and rivers, to well-drained white spruce forest.

Lonicera dioica L.

Hst. sandy clearing around fire-tower (in fruit August 4, 1952), No. 3755; Long. old jack pine forest, No. 3665.

Rare, collected only twice at the western end of the Clay Belt. Occurring in sandy areas in jack pine forest and in clearings. Reported northward to the Attawapiskat R. by DLD. Our material is var. *glaucescens* (Rydb.) Butters.

Lonicera hirsuta Eat.

LTO. lakeshore bank, No. 2507; LAO. lakeshore thickets (in anthesis July 12, 1953), No. 5066; Math. thickets on creek-bank, No. 3177; Long. old white spruce forest, No. 3679.

Frequent in thickets and openings, on shores of lakes and rivers, and less frequent in the forest. Reported northward on the Albany R. by DLD.

Symphoricarpos albus (L.) Blake

VM. sandy bank below red pine stand, No. 5983; LTO. clearing on lake shore, No. 2501; Math. high grassy river-bank, No. 5540; Kap. ravine, white spruce forest (in anthesis July 5, 1953), No. 5013; Hst. path along river-bank, No. 3750.

In No. 5540 the leaves are glabrous beneath, and the collection was made from a grassy river-bank close to a forestry station. This suggests var. *laevigatus* (Fern.) Blake, introduced from the Pacific slope. According to Gray's Man. the typical form may also be quite glabrous and var. *laevigatus* is "too difficult to separate on stable morphological characters." Since our collection matches the typical variety in other respects, it seems best to leave it with the other Clay Belt collections which match the typical variety in all respects.

Frequent in openings above dry shores and in clearings in the L. Timiskaming portion of the Clay Belt, scarcer elsewhere in our region. Reported as occasional northward on the Albany R. by DLD.

Symphoricarpos occidentalis Hook.

Tim. rocky outcrop at lake outlet near power development (first fruits mature August 15, 1952), No. 3997.

Rare, collected only at one rocky locality in the Clay Belt and here probably at the northeastern limit of its range. It has been collected at several stations on the north shore of L. Superior by the Hosie and Taylor parties but is not listed for southern Ontario by Soper (1939) nor west of James B. by DLD, nor in the Flore Laurentienne (Victorin, 1935).

The L. Superior specimens were collected on railway ballast and embankment, and on lighthouse clearing. Our collection was taken near a hydro-electric power development where there had evidently been much disturbance during construction. This suggests that its status in northern Ontario may be adventive. In the National Herbarium there is a single specimen from eastern Ontario labelled "rocky ridge—Portland Twp., Frontenac Co., July 1860—quite indigenous—Dr. Dupuis."

Linnaea borealis L.

VM. clearing in red pine woods, No. 4716; NL. roadside through poplar woods No. 2455; LAO. eroding clay shore (in anthesis June 28, 1952), No. 2862; Kap. spruce-birch-poplar forest, No. 4980.

One of the most frequent plants of the Clay Belt forest occurring in the mixed deciduous-coniferous woods on the drier sites and also common in the black spruce forest above the level of the low muskeg forest where drainage is lacking. Spreading vigorously after pulpwood cutting and along trails. Our material is var. *americana* (Forbes) Rehd.

Triosteum aurantiacum Bickn. was reported on L. Superior at Batchawana by Taylor (as *T. perfoliatum* var. *aurantiacum*). This species may possibly be found within the southern margin of the Clay Belt.

Viburnum cassinoides L.

LWas. boulder lake shore, alder thicket, No. 5761; Amos, white spruce woods, No. 2930; LaS. thicket below rocky outcrop (in anthesis June 29, 1952), No. 2875; LL. ashwoods, No. 2718; LAO. spruce-birch forest on rocky hilltop, No. 5101.

Frequent in the eastern and central portions of the Clay Belt but not seen at the western end of our area. Occurring in thickets above shores, in margins of woods, and in openings on rocky hillsides. Not reported northward.

Viburnum edule (Michx.) Raf.

BellR. rocky portage through alder thicket, No. 5818; Tas. aspen poplar woods, No. 5694; Tim. river-bank thickets beneath white spruce (in anthesis June 11, 1953), No. 4759; Kap. sandy lakeshore thickets, No. 4876; Long. river shore (fruit ripe August 1, 1952), No. 3687.

Common throughout the northern main portion of the Clay Belt, becoming less frequent in the vicinity of L. Timiskaming. Occurring in thickets along shores in clearings and in mixed deciduous-coniferous forest.

Viburnum trilobum Marsh.

NL. clay-banked ravine, poplar-spruce woods, No. 2689; LWas. thickets on boulder lake shore, No. 5759; LAO. lakeshore woods (in anthesis June 28, 1952), No. 2864; Tim. damp steep river-bank (fruit ripe August 17, 1952), No. 4055; Long. river shore, No. 3677.

Frequent in thickets on shores and in openings in the woods.

Sambucus pubens Michx.

NL. wet, grazed poplar woods, No. 2487; LTO. limestone talus slope (in anthesis May 27, 1954), No. 5556.

These specimens have the leaflets downy beneath, placing them with the typical form in the treatment of Gray's Man.

LTQ. open, rocky lake shore, No. 4674; NL. sandy roadside through jack pine forest, No. 2632; Amos, alder thicket around silted lake, No. 5679; Kap. thickets along river shore, No. 3359.

The above series has the leaflets glabrous beneath, as in forma *calva* Fern., which was collected more frequently than the typical form.

Common in the L. Timiskaming portion of the Clay Belt, becoming rare northward, although its range extends north of our region. Occurring on rocky shores and openings, in thickets, and in openings and clearings in the forest.

VALERIANACEAE

Valeriana septentrionalis Rydb.

In a specimen in the National Herbarium of Canada, roots, rosette-leaves, and broken stems of this species are preserved from material collected at Long L. by T. W. Waugh, August, 1916. This is the only record of this plant from within the Clay Belt.

CUCURBITACEAE

Echinocystis lobata (Michx.) T. & G.

NL. bridge embankment through poplar-spruce woods (in anthesis July 27, 1953), No. 5312; Tim. lake shore, No. 4033; LKap. clearing on sandy lake shore, No. 6067; Kap. path beside marshy creek, No. 3350.

Occasional in clearings on shores and roadsides, and not reported northward.

CAMPANULACEAE

Campanula rapunculoides L.

Tim. vacant town lot (in flower August 19, 1952), No. 4090.

Rarely escaped from gardens on waste land. Not reported northward.

Campanula rotundifolia L.

LTQ. open, rocky shore, No. 4478; LTO. rocky lake shore (in flower July 28, 1953), No. 5332; Tim. rocky lake shore, No. 4041.

Frequent on open rocky shores of L. Timiskaming, rare elsewhere in the Clay Belt where such habitats are generally infrequent.

Campanula uliginosa Rydb.

C. aparinoides var. *uliginosa*, New B. & B.

Amos, open, grassy, alder zone, lake shore, No. 5394; Dup. wet, grassy lake shore, No. 4227; LAO. marshy river shore through alder thickets (in

flower July 16, 1953), No. 5162; LKap. sedge marsh, river shore, No. 6082; Kap. grassy bank on lake shore, No. 3440; Hst. marshy clearing at old lumber camp, No. 3828.

In No. 4227 the flowers are smaller, the peduncles leafy-bracted with a shorter naked summit suggesting *C. aparinoides* Pursh, but still within the lower limits of the dimensions given in Gray's Man. for *C. uliginosa*. According to Gray's Man. the northern limit of *C. aparinoides* is from Maine to Minnesota. The New B. & B., however, gives New Brunswick to Saskatchewan as the range for *C. aparinoides* passing northward into *C. uliginosa* which is treated as a variety.

Frequent in wet meadows, marshes, and alder thickets. Its distribution northward as far as Attawapiskat on James B. was mapped by DLD.

Lobelia inflata L.

VM. sandy lakeshore woods, No. 4532; LTQ. lakeshore clearing, No. 4461; Dup. abandoned field (in fruit August 22, 1952), No. 4178.

Scarce in our region in lakeshore woods and clearings. Not reported northward.

Lobelia Kalmii L.

LTO. shingle beach in front of cedar woods, No. 5220; Math. sedge marsh on silt (first flowers in anthesis July 13, 1952), No. 3122; Kap. grassy bank on lake shore; Long. silted shore, No. 3617.

Occasional on open sandy and silted shores and grassy banks.

Lobelia Dortmanna L.

VM. silted lake shore in 4 inches of water (in flower July 21, 1954), No. 5967; Amos, silted, sandy lake shore, No. 5395; Tas. submersed, sandy shallows of L. Berry, No. 4324; Gog. silted shore of small lake in 3 inches of water, No. 6030.

Locally abundant at a few small lakes in the Clay Belt, in shallow water or stranded on silted shores. Collected northeast of our region in the L. Chibougamau area by Hustich, No. 175; and listed for the James B. area by J. M. Macoun (1895), although no specimen has been found to confirm that listing.

COMPOSITAE

Eupatorium maculatum L.

Dup. lake shore of boulders and sand, No. 4147; Long. river shore (in flower August 1, 1952), No. 3676.

Common throughout our region on lake and river shores, creek-banks, and wet clearings.

Eupatorium perfoliatum L.

VM. birch-maple woods on lake shore (heads in bud July 20, 1954), No. 5949.

Rare, found only once on a wooded lake shore in the L. Timiskaming portion of the Clay Belt where this species reaches its northern limit for this longitude.

GRINDELIA SQUARROSA (Pursh) Dunal has been collected on L. Superior in Sibley Twp. by Taylor, Losee & Bannan, No. 1687. This adventive from the west may turn up within the Clay Belt.

Solidago caesia L. was collected at Michipicoten on L. Superior by Hosie, Harrison & Hughes, No. 383. Possibly this species will be found within the southern margin of our region.

Solidago squarrosa Muhl.

LTQ. clearing on lake shore (in fruit September 10, 1952), No. 4449.

Rare, found only once in a clearing in the L. Timiskaming portion of the Clay Belt where this species reaches its northern limit for this longitude.

Solidago macrophylla Pursh

VdO. birchwoods, lake shore, No. 5515; Amos, alder thicket beside creek, No. 5480; Tas. black spruce-birch forest on damp rocky hillside, No. 4257; LKap. trail through black spruce forest, No. 6060; Kap. roadside clearing, No. 3461.

Frequent at the eastern end of the Clay Belt, becoming occasional westward in our area. Occurring in a variety of damp, shaded habitats in mixed deciduous coniferous forest, shore thickets, and spreading along woodland trails.

Solidago hispida Muhl.

LTO. open, rocky shore, No. 4479; Tas. sandy openings in jack pine forest, No. 4275; Math. sandy opening in jack pine forest (in flower July 18, 1952), No. 3285; Tim. dry sandy openings in jack pine forest, No. 4049.

The above collections belong to the typical variety having stems pilose with ashy pubescence.

Common in dry, sandy, and rocky places throughout our area. One of the most frequent plants of the sandy jack pine forest where it spreads along sides of trails and roads in great profusion.

NL. open, rocky river shore, No. 5323; Tas. sandy roadside through jack pine forest, No. 5432; Tim. open, rocky lake shore (in flower July 17, 1952), No. 4043; Kap. rocky shore at falls, No. 3550; Hst. gravelly clearing on river-bank, No. 3718.

The above series represents var. *lanata* (Hook.) Fern., having stems lanate.

Equalling the typical variety in frequency, apparently preferring open rocky sites to the sandy openings.

There is much material collected by the Taylor and Hosie parties on the north shore of L. Superior of *Solidago Randii* (Porter) Britt., and considerably less of *S. racemosa* Greene. (These are both treated under *S. spathulata* in the New B. & B.) The nearest station to our region is Schreiber where Hosie, Losee & Bannan collected *S. Randii,* Nos. 481 and 485, and *S. racemosa,* No. 384. These species would therefore be expected in the nearby Clay Belt, and we may have overlooked them in mistake for the common and similar *S. hispida,* to which all our pilose collections belong.

Solidago Purshii Porter

S. uliginosa, Gray's Man. ed. 7, New B. & B. (as var. *peracuta* (Fern.) Friesner.)

Hst. clearing on river-bank (in flower August 3, 1952), No. 3717.

In this collection the leaves are reduced in size below the thyrse as in var. *elongata* (Nutt.) Fern.

Scarce in the Clay Belt, this species occurs in thickets and clearings.

Solidago gigantea Ait.

Dup. lake shore of boulders and sand, No. 4149; Coch. river-bank (in flower August 12, 1952), No. 3947.

Scarce in the Clay Belt on shores of lakes and rivers. Noted as frequent north of our region along the Albany and Attawapiskat rivers by DLD. Our material is var. *leiophylla* Fern.

Solidago graminifolia (L.) Salisb.

LTQ. rocky lake shore, open pine woods (in flower July 24, 1953), No. 5266; Amos, sandy bank above silted lake shore, No. 5388; Tas. thickets around sandy lake, No. 4338; Long. sandy bank of lake shore, No. 3607.

The above series have the narrow leaves and puberulent stems of var. *Nuttallii* (Greene) Fern. In some collections (Nos. 5266 and 3607) a few of the plants are nearly glabrous, approaching the typical variety with which var. *Nuttallii* might be united according to the New B. & B.

LTQ. open, rocky shore, No. 4477; Dup. lake shore of boulders and sand, No. 4148.

These specimens have the relatively broader leaves of var. *major* (Michx.) Fern.

This species is common throughout the Clay Belt on open, sandy, and rocky shores, occurring also in thickets, openings, and clearings. The most frequent variety is var. *Nuttallii*.

Aster macrophyllus L.

LTO. clearing on shingle lake shore (in flower July 21, 1953), No. 5211; NL. open rocky river shore, No. 5325; VdO. roadside through spruce woods, No. 5520; Math. clearing at old sawmill, No. 5535; Long. roadside through black spruce forest, No. 3660.

The Clay Belt material differs from the typical variety of Gray's Man. in having villous stems. In Nos. 5520 and 5535 the cauline leaves taper to the base as in var. *velutinus* Burgess; and in No. 3660 they are cordate as in var. *sejunctus* Burgess. In the two other collections this distinction is not clear. According to the New B. & B. some of the segregates of this highly variable species should possibly be recognized as varieties "but they are only weakly defined."

The most frequent and abundant plant of the mixed deciduous-coniferous forest. Forming with *Aralia nudicaulis* and *Cornus canadensis* the characteristic ground cover of the well-drained forest of the Clay Belt. Usually suppressed and sterile in the forest, it spreads and flowers vigorously following pulpwood cutting and in other openings and clearings. Not reported north of our region.

NL. sandy roadside through young jack pine – aspen poplar woods (in flower July 22, 1953), No. 5254; Amos, sandy bank above silted lake shore, No. 5384; and low thicket, *Myrica-Alnus,* No. 5484; Kap. sedge marsh around small lake, No. 6122; Hst. boggy ground around small lake, No. 3832.

Common throughout the Clay Belt in marshy and boggy ground around lakes, on sandy shores and openings, and in open damp thickets. Victorin states (1935, p. 600): "C'est la Verge d'or la plus commune d'Abitibi, où elle remplace largement le *S. canadensis.*"

Solidago juncea Ait.

LTQ. lake shore, margin of balsam poplar woods, No. 5280; Coch. rocky river shore, No. 4623; Math. sandy opening in jack pine forest, No. 3287.

Occasional on rocky shores and sandy openings in the jack pine forest. Listed northward by Hustich (1955) on the Moose R.

Solidago nemoralis Ait. has been collected at Schreiber on L. Superior by Hosie, Losee & Bannan, No. 459. This species may occur within the southern margin of the Clay Belt.

Solidago rugosa Mill.

VdO. roadside through bog, No. 5526; Amos, roadside ditch through farmland (in flower August 9, 1953), No. 5454; Coch. shore of small sandy lake, No. 3885; and roadside at lake shore, No. 3906.

All the above collections have the sordid-villous stems with branches of the panicle much exceeding the subtending leaves as in the typical variety in the treatment of Gray's Man. The Clay Belt material varies greatly in the leafiness and branching of the panicle.

Amos, lakeshore thickets, No. 5472; Dup. creek-bank through farmland, No. 4180.

These specimens have sordid-villous stems with the lower lateral racemes overtopped by the subtending leaves as in var. *villosa* (Pursh) Fern.

Frequent in a variety of open habitats on shores of lakes and streams, and spreading along roadside ditches. This species is listed northward by Hustich (1955) on the Moose R.

Solidago canadensis L.

VdO. roadside through bog, No. 5527; Amos, low thicket, *Myrica-Alnus,* No. 5483; Hst. river-bank clearing (in flower August 3, 1952), No. 3738.

Occasional in thickets and clearings and on roadsides.

Solidago lepida DC.

Coch. river-bank thickets (in flower August 12, 1952), No. 3942; Kap. clearing in spruce-poplar woods, No. 3520.

In this material the leaves extend into the panicle as elongate bracts as in var. *fallax* Fern.

Hst. clearing on river-bank (in flower August 3, 1952), No. 3717.

In this collection the leaves are reduced in size below the thyrse as in var. *elongata* (Nutt.) Fern.

Scarce in the Clay Belt, this species occurs in thickets and clearings.

Solidago gigantea Ait.

Dup. lake shore of boulders and sand, No. 4149; Coch. river-bank (in flower August 12, 1952), No. 3947.

Scarce in the Clay Belt on shores of lakes and rivers. Noted as frequent north of our region along the Albany and Attawapiskat rivers by DLD. Our material is var. *leiophylla* Fern.

Solidago graminifolia (L.) Salisb.

LTQ. rocky lake shore, open pine woods (in flower July 24, 1953), No. 5266; Amos, sandy bank above silted lake shore, No. 5388; Tas. thickets around sandy lake, No. 4338; Long. sandy bank of lake shore, No. 3607.

The above series have the narrow leaves and puberulent stems of var. *Nuttallii* (Greene) Fern. In some collections (Nos. 5266 and 3607) a few of the plants are nearly glabrous, approaching the typical variety with which var. *Nuttallii* might be united according to the New B. & B.

LTQ. open, rocky shore, No. 4477; Dup. lake shore of boulders and sand, No. 4148.

These specimens have the relatively broader leaves of var. *major* (Michx.) Fern.

This species is common throughout the Clay Belt on open, sandy, and rocky shores, occurring also in thickets, openings, and clearings. The most frequent variety is var. *Nuttallii*.

Aster macrophyllus L.

LTO. clearing on shingle lake shore (in flower July 21, 1953), No. 5211; NL. open rocky river shore, No. 5325; VdO. roadside through spruce woods, No. 5520; Math. clearing at old sawmill, No. 5535; Long. roadside through black spruce forest, No. 3660.

The Clay Belt material differs from the typical variety of Gray's Man. in having villous stems. In Nos. 5520 and 5535 the cauline leaves taper to the base as in var. *velutinus* Burgess; and in No. 3660 they are cordate as in var. *sejunctus* Burgess. In the two other collections this distinction is not clear. According to the New B. & B. some of the segregates of this highly variable species should possibly be recognized as varieties "but they are only weakly defined."

The most frequent and abundant plant of the mixed deciduous-coniferous forest. Forming with *Aralia nudicaulis* and *Cornus canadensis* the characteristic ground cover of the well-drained forest of the Clay Belt. Usually suppressed and sterile in the forest, it spreads and flowers vigorously following pulpwood cutting and in other openings and clearings. Not reported north of our region.

Aster ciliolatus Lindl.

LTQ. clearing on lake shore, No. 4453; NL. thin soil on limestone, No. 5195; Tas. marshy shore of pond, No. 4284; Dup. creek-bank, No. 4192; Kap. river-bank thickets (in flower July 20, 1952), No. 3299; Long. railroad embankment, No. 3579.

Common throughout our region on shores, in thickets, and spreading abundantly into clearings and neglected farm fields.

Aster modestus Lindl.

Tim. sedge meadow around bog, No. 4065, and 6-year-old burn in black spruce forest, No. 5542; Kap. roadside clearing, No. 3460; Hst. clearing on river-bank, No. 3701.

Occasional, in sedge meadow, clearings, and after fire in the forest. Found only in the Ontario portion of the Clay Belt where this species reaches its eastern limit for this latitude.

Aster puniceus L.

Amos, sandy bank above silted lake shore (in flower August 4, 1953), No. 5383, and field, roughly broken, No. 5493; Tim. lumber road through cedar woods, No. 4000.

The above material has the stem harshly hispid on the median internodes and the dimensions of the typical variety in the treatment of Gray's Man.

Coch. marshy shore of backwater (in flower August 10, 1952), No. 3899.

This specimen has the stem glabrous up to the middle as in var. *firmus* (Nees) T. & G.

Dup. road clearing in black spruce forest, No. 4162; Hst. sandy clearing around fire-tower (in flower August 4, 1952), No. 3754.

The two collections above have few heads with large leafy bracts and the outer foliaceous phyllaries hiding the inner ones, which places them with var. *oligocephalus* Fern.

This species occurs frequently throughout our area on shores and in thickets and damp clearings.

Aster radula Ait.

VdO. drainage ditch in black spruce forest (in flower July 8, 1952), No. 3056, and railway cinders spread into bog, No. 5528; Tas. roadside through open bog, No. 4336, and bank of slow-moving stream, No. 4262.

The plants of these collections have 1 to 15 heads and are 9 to 21 inches tall. The small one-headed specimens match material named var. *strictus* (Pursh) Gray. These, however, occur together with more robust, many-headed plants (e.g. No. 4336), and it seems best to follow the New B. & B. by regarding that variety as "only very doubtfully valid."

Rare, on margins of bogs and ditches, and on bank of boggy stream. Found only in the Quebec portion of the Clay Belt where this species evidently reaches its western limit for this latitude.

Aster pilosus (Willd.) var. *Pringlei* (Gray) Blake has been reported on L. Superior at Batchawana by Taylor (det. P. V. Krotkov, distributed as *A. Faxoni*). It is possible that this species may be found within the southern margin of the Clay Belt.

Aster lateriflorus (L.) Britt.

VM. poplar-birch woods, No. 4509; NL. roadside through limestone exposure, No. 5317; Dup. roadside, foot of rocky outcrop, No. 4140; Coch. thickets beside rocky rapids, No. 3982; Kap. path along river shore (in flower July 20, 1952), No. 4596; Hst. rivershore thickets, No. 3774.

Most of the Clay Belt material has the heads on long slender branchlets or pedicels as in var. *tenuipes* Wieg. A few (e.g. No. 3982) have much shorter branchlets or pedicels which suggest the typical variety. Gray's Man. notes that the variety is strikingly distinct in its extreme (such as our No. 3774) "but passing freely into" the typical state.

Frequent in dry rivershore thickets, occurring also on open dry shores, and in deciduous woods and clearings. Reported northward at Moose Factory by DLD.

Aster simplex Willd.

Tas. river shore, No. 4300; Dup. creek-bank through farmland, No. 4179; Coch. river-bank (in flower August 12, 1952), No. 3964, and rocky shore, No. 3952.

The above collections have the relatively broad leaves of the typical variety in the treatment of the New B. & B.

Amos, roadside through farmlands, No. 5464, low thickets, *Myrica-Alnus*, No. 5481, field roughly broken, No. 5492; Dup. creek-bank through farmland, No. 4177; Coch. lake shore, No. 3939; Math. hillside clearing above lake (in flower July 18, 1952), No. 3290; Kap. river shore, No. 3493.

These collections have the relatively narrow leaves of var. *ramosissimus* (T. & G.) Cronq.

LTQ. lakeshore clearing, No. 4457; NL. poplar-spruce woods, ravine (in flower July 27, 1953), No. 5314.

These specimens are robust plants with many smaller heads which probably place them with var. *interior* (Wieg.) Cronq.

This species is common throughout the Clay Belt on river shores and banks and in clearings. The var. *ramosissimus* is evidently the commonest variety; var. *interior* was collected only in the L. Timiskaming portion of the Clay Belt.

Aster Tradescanti L.

LTO. shingle beach in front of cedar woods (in flower July 21, 1953), No. 5224; Sen. rivershore thickets, No. 4351; VdO. open gravelly lake shore, No. 5505; Dup. lake shore, sand and boulders, No. 4094; Long. road through black spruce forest, No. 3576.

Occasional on gravelly and sandy shores and in clearings. Not reported northward.

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Aster junciformis Rydb.

Long. sandy bank on lake shore (in flower July 30, 1952), No. 3609.

Rare, found only once in the Clay Belt on the shore of a small lake.

Aster ptarmicoides (Nees) T. & G.

LTQ. open, rocky lake shore, No. 4475; NL. open, rocky river shore, No. 5324; BellR. rocky portage trail through alder thicket (in flower July 6, 1954), No. 5811; Sen. rocky river shore, No. 4356; Kap. rocky outcrop at falls, No. 3339.

Frequent on rocky shores and in thickets. This species probably reaches its northeastern limit in our area on the Bell R. DLD report it northwest of our region, as occasional on the Albany R. and Attawapiskat R.

Aster nemoralis Ait.

Sen. small boggy lake, No. 4389; VdO. bank of ditch through bog (in flower August 24, 1953), No. 5525; Tas. road through open bog, No. 4337.

Rare in the Clay Belt on margins of open bogs and boggy ditches. Collected northward on the Rupert R. by J. M. Macoun, August 24, 1885.

Aster umbellatus Mill.

NL. poplar-spruce woods, ravine (in flower July 27, 1953), No. 5313; VdO. alder-mountain maple thicket, lake shore, No. 5503; Dup. lake shore, No. 4231; Coch. river-bank, No. 3945; Kap. clearing on rocky river shore. No. 3337.

Most of the above material and all other collections have the leaves more or less tomentose beneath and the phyllaries pubescent on the back as in var. *pubens* Gray in the treatment of Gray's Man., and *A. pubentior* in the New B. & B. In No. 3945 the undersides of the leaves are glabrous, suggesting the typical variety, into which var. *pubens* too often passes according to Gray's Man.

Common throughout the Clay Belt on dry shores and banks, in thickets, and spreading into openings and clearings in the forest. This species reaches its western limit in the James B. area according to DLD.

Erigeron hyssopifolius Michx.

Kap. rocky shelves at rapids (in flower June 27, 1953), No. 4920 and river shore at Big Beaver Falls, No. 3543; Hst. black spruce – white cedar woods beside rapids, No. 4618.

Rare in the Clay Belt, found only on rocky shores near rapids of the Kapuskasing and Shekak rivers at the western end of our region.

Erigeron philadelphicus L. Philadelphia Fleabane

NL. roadside clearing (in flower June 17, 1952), No. 2683; LaS. road through pasture field, No. 4560; Kap. wet clearing on gravelly shore of small lake, No. 5011.

A common weed in the farmlands of the Little Clay Belt, occasional in clearings elsewhere in our area. It has been collected north of the Clay Belt on Moose Factory I., Baldwin, No. 1556.

Erigeron annuus (L.) Pers. Annual Daisy Fleabane

LTQ. clearing on lake shore, No. 4452; Math. ditch through black spruce forest (in flower July 13, 1952), No. 3183.

An occasional weed in our area in clearings and fields. Not reported northward.

Erigeron strigosus Muhl. Rough Daisy Fleabane

VM. roadside through white spruce – birch woods near summer cottages, No. 5957; NL. roadside through farmland, No. 5200; VdO. ditch in black spruce forest (in flower July 8, 1952), No. 3061; Amos, railway through poplar woods, No. 3004; Hst. grassy clearing around fire-tower, No. 3762.

All our collections have the hairs of the stem short and appressed as in the typical variety.

Abundant in fields on flanks of rock knobs of the Quebec side of L. Timiskaming and common throughout our region as a weed of clearings and roadsides.

Erigeron angulosus Gaudin

E. acris var. *asteroides*, New B. & B.

LAO. open rocky point (in flower July 16, 1953), No. 5167; Kap. lake-shore thickets, No. 3439; Hst. rivershore woods, No. 3842; Long. sandy bank on lake shore, No. 3608.

Occasional in the Clay Belt on open sandy and rocky shores, and in thickets. Our material is var. *kamtschaticus* (DC.) Hare.

Erigeron canadensis L. Canada Fleabane

Conyza canadensis, New B. & B.

VdO. roadside through gravelly clearing, No. 5513; LAO. sandy beach, No. 5124; Math. sandy clearing in jack pine forest (in flower July 13, 1952), No. 3106.

Occasional in sandy and gravelly clearings, on roadsides and shores. Sometimes in clearings forming large, weedy colonies of heavily fruiting plants from only 4 up to 26 inches high (e.g. No. 5513).

Antennaria canadensis Greene

A. neglecta var. *Randii*, New B. & B.

NL. clearing on limestone ridge, thin soil (in flower June 12, 1952), No. 2499; LAO. eroding clay shore, No. 2859; Tim. open rocky shelves at falls, No. 4855; Kap. rocky shore at falls, No. 3549.

Occasional on open rocky shores and in dry clearings and openings. Reported northward on the Harricanaw R. by Dutilly and Lepage (1952).

Antennaria neodioica Greene

A. neglecta var. *attenuata*, New B. & B.

LTO. rocky lake shore, No. 4489.

This over-mature collection has the linear-attenuate phyllaries of var. *attenuata* Fern.

LL. roadside through clearing (in flower June 22, 1952), No. 2805.

In this collection the plants have the generally larger dimensions and white petaloid tipped phyllaries of var. *grandis* Fern.

This species is rare in the Clay Belt occurring on an open rocky shore and in a sandy clearing. The var. *chlorophylla* Fern. has been collected north of our region on the George R. (east coast of James B.) by Lepage, No. 12,682 (det. A. E. Porsild).

Antennaria munda Fern.

Hail. rocky shelves, in dry moss, at The Notch on the Montreal R. (in flower May 30, 1954), No. 5615.

This collection probably belongs with *A. munda* using the key in Gray's Man., and with *A. plantaginifolia* var. *ambigens* in the treatment of the New B. & B. Probably here at the northern limit of its range for this longitude.

Anaphalis margaritacea (L.) C. B. Clarke

LTQ. open, rocky lake shore, No. 4491; Tas. gravelly clearing in jack pine forest, No. 5431; Hst. clearing on river-bank (in flower August 3, 1952), No. 3696.

Common throughout the Clay Belt in rocky, sandy, and gravelly openings and clearings. Often forming extensive colonies on dry roadsides.

Gnaphalium Macounii Greene

Tim. roadside through black spruce forest (in flower and fruit August 15, 1952), No. 4017.

Rare, collected only once in the Clay Belt, on a roadside, and not reported northward.

Gnaphalium uliginosum L.

VM. sandy clearing in birch woods, former pinery (in flower July 19, 1954), No. 5930; Amos, clay creek-bank, No. 5425; Tas. alluvial river shore, No. 4294; Dup. abandoned field, No. 4187.

Occasional, more frequent at the Quebec end of the Clay Belt where it forms large colonies in open places either on wet clay shores or in dry clearings. Not reported north of our region.

Ambrosia trifida L. Giant Ragweed

LTQ. roadside through fields (in anthesis July 24, 1953), No. 5283; VM. roadside near summer cottages, No. 5958; Tim. vacant town lot, No. 4089.

A frequent weed in the L. Timiskaming portion of the Clay Belt on roadsides and waste land, scarce elsewhere in our area, and not reported northward.

Ambrosia artemisiifolia L. Common Ragweed

LTQ. open, rocky lake shore, No. 4647; NL. railway yards in town (flowers in bud July 29, 1953), No. 5358.

These specimens have the long soft hairs of forma villosa Fern. & Grisc.

An occasional weed of roadsides, waste places, and rocky openings in the L. Timiskaming portion of the Clay Belt. Collected at Amos by H. Groh, Sept. 6, 1938, and at Kapuskasing by E. G. Anderson, No. 1863. Not reported north of our region. Our material is var. ELATIOR (L.) Descourtils.

AMBROSIA PSILOSTACHYA DC. var. CORONOPIFOLIA (T. & G.) Farw. has been collected several times on L. Superior, the nearest station being Schreiber by Hosie, Losee & Bannan, No. 304 (revised by H. J. Scoggan). Frankton (1955) notes that "the perennial ragweed is a common native in Western Canada and in recent years has spread east apparently along railway lines." This weed probably will be found in our region.

Heliopsis helianthoides (L.) Sweet

Coch. roadside at shore of Lillabelle L. (in flower August 10, 1952), No. 3896.

Rare in the Clay Belt and not reported north of our region. Our material is var. *scabra* (Dunal) Fern.

Rudbeckia laciniata L.

Kap. roadside clearing (in flower July 24, 1952), No. 3459.

Rare, collected only once in our region and not reported northward.

RUDBECKIA SEROTINA Nutt.

R. hirta, New B. & B.

VM. young maple-poplar woods, No. 5965; Dup. abandoned field, No. 4181; Coch. roadside at lake shore, No. 3905; Math. roadside through farmland (in flower July 19, 1952), No. 3294.

Occasional in dry fields, roadsides, and margins of woods in the farmlands of the Clay Belt. Not reported northward. Our material is var. SERICEA (T. V. Moore) Fern. & Shrub.

HELIANTHUS ANNUUS L.

VM. old clearing (Fort Timiskaming) on lake shore, No. 4535; Tas. sandy roadside through black spruce forest (in flower August 29, 1952), No. 4283.

A rare adventive in the Clay Belt around settlements and along roadsides. Not reported northward.

HELIANTHUS LAETIFLORUS Pers.

Amos, railway through poplar woods, No. 3010; Tim. clearing at lake outlet (in flower August 15, 1952), No. 3995.

A rare adventive in our region on railways and in clearings. Not reported northward. Our material is var. SUBRHOMBOIDEUS (Rydb.) Fern.

HELIANTHUS MAXIMILIANI Schrad.

Kap. river shore at town park (in flower July 26, 1952), No. 3492.

Found only on shore of Kapuskasing R., probably introduced through adjacent town park. Not reported northward.

Helianthus giganteus L.

Tim. clearing at lake outlet, No. 3659; Coch. roadside at lake shore, No. 3897; LKap. clearing beside railway (in flower July 31, 1954), No. 6099.

Scarce and found only in the Ontario portion of the Clay Belt in vigorous colonies on railways, roadside and in clearings. Not reported northward

Coreopsis lanceolata L. has been recorded on L. Superior at Batchawana by Taylor (specimen det. F. V. Kortright). This plant may possibly be found northward in the Clay Belt

Bidens cernua L.

LTQ. lake shore, No. 4413; Amos, mud flats around shallow lake, No. 5486; Tas. alluvial river shore, No. 4233; Dup. lakeshore woods, No. 4195; Coch. shore of small lake, No. 3873, and marshy shore (in flower August 10, 1952), No. 3895.

The Clay Belt material of this highly variable species includes plants that are tall and robust (No. 4195), much branched (No. 5486), strongly nodding (No. 4413), intermediate (No. 4233), down to small, simple, few-flowered plants with petioled leaves such as No. 3873 belonging to var. *minima* (Huds.) Pursh in the treatment of Gray's Man.

Forming large colonies on open muddy flats around shallow lakes and alluvial river shores, and common throughout our region on muddy shores, marshes, and low shore woods. The var. *integra* Wieg. is locally abundant on the coast at the foot of James B. according to DLD.

Bidens vulgata Greene

Tim. vacant town lot (in flower August 16, 1952), No. 4018.

This material and another collection from the same vicinity (F. N. Cowell, July 30, 1955) have the finely puberulent stems, leaves, and foliaceous bracts of forma *puberula* (Wieg.) Fern.

Rare, collected as an adventive on waste land and on a sandy lake shore only in the vicinity of Timmins. Not reported north of our region.

Bidens frondosa L.

Amos, railway yards in town (in flower August 16, 1953), No. 5499; Tas. silted lake shore near town, No. 4247.

Occasional in our region, found always near towns as a weed on waste land and along railways and shores. Listed northward in the James B. area by J. M. Macoun (1885), but there are no specimens in the National Herbarium to substantiate this record.

Megalodonta Beckii (Torr.) Greene

Bidens Beckii, New B. & B.

Dup. shallow water in quiet bay (in flower August 24, 1952), No. 4218; Tim. small sandy lake, No. 4061; LKap. in one foot of water, marshy backwater, No. 6073; Kap. shallow bay of river, No. 3517.

Occasional throughout the Clay Belt in shallow water of quiet bays and sluggish streams through marshes. Reported northward at Albany by DLD.

Gaillardia pulchella Foug. has been collected on L. Superior on the railway at Schreiber by Hosie, Losee & Bannan, No. 406; and at Peninsula by Taylor, Bannan & Harrison, No. 361 (both distributed as *G. aristata*). This plant will probably be found in the nearby Clay Belt as a railway adventive or garden escape.

Achillea Ptarmica L.

Kap. river shore near town park (in flower July 26, 1952), No. 3491.

Occasionally escaped from gardens in waste land and roadsides. Reported northward at Moose Factory by DLD.

Achillea Millefolium L. Yarrow

NL. rocky outcrop in young birch-aspen woods (in flower July 22, 1953), No. 5251; Long. railway embankment, No. 3586.

Common throughout the Clay Belt as a weed of waste land, fields, roadsides, and spreading far into the forest in clearings around settlements.

VdO. clearing on river-bank (in flower July 10, 1952), No. 3071.

This collection has the rose-coloured flowers of forma rosea Rand & Redf., which occurs rarely in our area.

According to Frankton (1955): "yarrow as found from southern Newfoundland to Ontario has been introduced in large part from Europe. The more northerly and western yarrows are native."

Achillea lanulosa Nutt. Woolly Yarrow

A. Millefolium ssp. *lanulosa*, New B. & B.

VdO. road through alder thickets, No. 3086; LAO. lakeshore clearing. No. 5068; LL. open, rocky lake shore (in flower June 19, 1952), No. 2721.

Occasional in our area in clearings and on shores and roadsides.

Anthemis Cotula L., the stinking mayweed, has been reported on L. Superior at Batchawana by Taylor. It is possible that this weed will be found on roadsides and waste places in our region.

Anthemis tinctoria L.

Kap. river-bank (in flower July 26, 1952), No. 3510.

Seen only once, naturalized on a river-bank where it had evidently come from the nearby town park. Not reported northward.

Matricaria matricarioides (Less.) Porter

VdO. clearing on river-bank (in flower July 10, 1952), No. 3074; LaS. sandy waste land around town dump, No. 5893; LAO. grassy clearing, rivershore settlement, No. 5088.

A frequent weed of yards and roadsides throughout our region.

Chrysanthemum Leucanthemum L. Ox-eye Daisy

NL. railway embankment through poplar woods (in flower June 15, 1952), No. 2645; OttR. lakeshore clearing, No. 5832; Kap. grassy clearing on river-bank, No. 4926.

A common weed throughout the Clay Belt on roadsides and in clearings. Abundant in neglected fields where, together with tall buttercup (Ranunculus acris), it does much to reduce the value of the pasture for

cattle. Our plant is treated as var. PINNATIFIDUM Lecoq & Lamotte in Gray's Man.

CHRYSANTHEMUM BALSAMITA L. was reported on L. Superior at Batchawana by Taylor. This plant may also turn up in the southern settled part of the Clay Belt.

Two species of *Tanacetum* have been collected on L. Superior, and they may be found within our region. The introduced tansy, T. VULGARE L., was collected as a garden escape in Sibley Twp. by Taylor, Losee & Bannan, No. 1690. The native *T. huronense* Nutt. (typical in the treatment of Gray's Man.) was reported from Batchawana by Taylor, and other varieties on the west slope of James B. by DLD.

The Clay Belt lies within the range of *Artemisia caudata* Michx. and A. *canadensis* Michx. (included in *A. campestris* in the New B. & B.), both species having been reported from the north shore of L. Superior (Taylor) and from the western slope of James B. (DLD). We saw neither of them within our area which has little appropriate habitat. There remains the possibility that they may occur at the margin of our area at such places as Long L. and L. Timiskaming.

ARTEMISIA BIENNIS Willd.

Amos, railway yards in town (in flower August 16, 1953), No. 5495; Coch. railway yards, No. 3389; Hst. roadside through black spruce woods, No. 3843.

An occasional weed of railway yards and roadsides. Reported as frequent northward on the Albany R. by DLD.

ARTEMISIA ABROTANUM L.

Collected on the east side of L. Timiskaming by Marie-Victorin, Rolland-Germain & R. Meilleur: Fort-Témiscamingue, naturalisé autour du fort à la suite de cultures très anciennes, August 18, 1933. Not reported northward.

ARTEMISIA VULGARIS L.

LTO. sandy shingle beach (flowers in bud July 21, 1953), No. 5230; Math. road embankment at bridge, No. 3257.

A rare weed of roadsides and on a shingle beach. Not reported northward.

ARTEMISIA LUDOVICIANA Nutt.

VM. gravelly bank below red pine stand, No. 5985; Math. roadside, vacant land (with late flowers August 19, 1952), No. 4093.

A rare weed in the Clay Belt, of roadsides and a gravel bank. Not reported northward. Our material is var. GNAPHALODES (Nutt.) T. & G.

ARTEMISIA ABSINTHIUM L.

LTO. sandy lakeshore clearing (in flower July 28, 1953), No. 5333; Kap. vacant town lot, No. 3447.

In our region a rare weed of waste land. Collected northward at Moose Factory by DLD.

Petasites palmatus (Ait.) Gray

P. frigidus, New B. & B.

NL. creek-bank in spruce-poplar woods, No. 2543; LL. wet alder thicket, No. 2758; Hst. clearing in spruce-poplar woods (in flower June 2, 1954), No. 5634.

Common throughout the Clay Belt in low woods, thickets, and creek-banks where leaves are abundant and flowers rare; flowering well, however, in wet openings and clearings.

The two more northerly species of *Petasites* may reach the northern margin of the Clay Belt. *P. vitifolius* (*P. frigidus* var. *corymbosus* in the New B. & B.) was reported at Renison on the Moose R. by Hustich (1955). And *P. sagittatus* (Pursh) Gray was collected on L. Superior at Sibley by Taylor, Losee & Bannan, No. 1689.

SENECIO VULGARIS L. Common Groundsel

Amos, railway yards, No. 5494; Tas. embankment to bridge, No. 4307; LaS. sandy waste land around town dump (in flower and fruit July 17, 1954), No. 5894; Math. waste land, No. 3296.

An occasional weed of waste land in our area. Reported northward at Moosonee by DLD.

Senecio pauperculus Michx.

Not seen by us but collected in the Clay Belt between Amos and Senneterre: Barraute, tourbière desséchée, Marie-Victorin, Rolland-Germain & A. Blain, 3–5 Août 1941. This material is var. *Balsamitae* (Muhl.) Fern.

Senecio indecorus Greene

Amos, railway through poplar woods (in flower July 5, 1952), No. 3007; Coch. wet trail in old black spruce forest, No. 3921.

Rare in the Clay Belt in wet openings in the forest.

Senecio aureus L.

Amos, wet meadow beside lake, No. 2962; LaS. lakeshore woods, No. 2813; Tim. grassy clearing at mine head (in flower June 21, 1953), No. 4858; LKap. trail through black spruce forest, No. 6056; Hst. river-bank, No. 3753.

The Clay Belt material of this very variable species has radical leaves with margins more or less sharply toothed. Sorting our specimens on the basis of the radical leaf teeth into var. *aquilonius* Fern. and var. *intercursus* Fern. was doubtful, and the separation of questionable value.

Frequent in wet meadows and in openings and clearings in the forest.

ARCTIUM MINUS (Hill) Bernh. Common Burdock

LTQ. clearing on lake shore (with late flowers September 10, 1952), No. 4415; Coch. railway yards, No. 3394.

A frequent weed of waste ground in the L. Timiskaming portion of the Clay Belt, scarce northward in our area. Although this weed has not been reported northward beyond our region, the great burdock, A. LAPPA L., is listed at Moosonee by DLD.

Carduus nutans L.

A Clay Belt collection of this weed by Sirois at Ville Marie was reported by G. A. Mulligan and C. Frankton (The Canadian Field-Naturalist, Vol. 68, p. 35, 1954) whose map shows this as the northernmost record. This material is var. leiophyllus (Petrovic) Arenes.

Cirsium vulgare (Savi) Tenore Bull Thistle

Amos, steep clay river-bank (in fruit August 9, 1953), No. 5459; Coch. mucky shore of small lake, No. 3968.

An occasional weed in our area on shores and wet waste land. Not reported northward.

Cirsium muticum Michx.

VdO. ditch in black spruce forest, No. 3060; Math. roadside ditch through poplar woods, No. 3202; Gog. rocky creek-bank (in flower July 26, 1954), No. 6020; Hst. clearing on river-bank, No. 3720.

Frequent throughout the Clay Belt on creek-banks, wet woods, wet clearings, and ditches.

Cirsium arvense (L.) Scop. Canada Thistle

Amos, roadside through farmland (in flower August 9, 1953), No. 5450.

This specimen belongs to the typical form with pink-purple flowers.

A common weed of farm fields, roadsides, and waste places, and northward beyond our region.

Amos, roadside through farmland (same place as 5450), No. 5451.

This collection has the white flowers of forma albiflorum (Rand & Redf.) R. Hoffm. Much less common than the typical form and occurring with it.

Centaurea montana L.

This species was collected at Iroquois Falls in a pasture field of heavy clay soil by Bassett & Bragg, No. 1257 (DAO). The collectors noted that it was an escape of occasional frequency. Not reported northward.

Centaurea Jacea L. Brown Knapweed

VdO. railway station yard (in flower July 10, 1952), No. 3078.

Found only once in the Clay Belt established on waste ground near railway station. Not reported northward.

Cichorium Intybus L. Chicory

LTO. clearing on lake shore, No. 5241; Coch. vacant town lot (in flower July 19, 1952), No. 5390.

A rare weed in the Clay Belt in fields and on roadsides. Not reported northward.

Tragopogon porrifolius L. was collected on the railway at Jackfish on L. Superior near Schreiber by Hosie, Losee & Bannan, No. 493. Salsify may occur similarly as an introduced plant in the nearby Clay Belt.

TRAGOPOGON PRATENSIS L. Goatsbeard

This species was collected near Monteith (between Matheson and Iroquois Falls) in clay soil by the railway track by Bragg & Bassett, No. 70 (DAO). The collectors noted a large patch. Not reported northward.

TRAGOPOGON MAJOR Jacq. Goatsbeard

T. dubius in New B. & B.

This plant was collected from a small patch in the same habitat as the preceding species at Monteith by Bragg & Bassett, No. 71 (DAO). Also not reported northward.

The native *Taraxacum dumetorum* Greene has been reported north and south of the Clay Belt and may be expected within our area. The nearest collection was made on the Harricanaw R., apparently just beyond the margin of our region by Dutilly and Lepage (*see* map in DLD). Gray's Man. lists the Slate Is., which are in L. Superior near Schreiber, as another station.

The Eurasian TARAXACUM ERYTHROSPERMUM Andrz. was collected on L. Superior at Schreiber by Hosie, Losee & Bannan, Nos. 491 and 492 (at nearby Rossport and both numbers distributed as *T. laevigatum*). This species probably will be found within the southern margin of our region.

TARAXACUM OFFICINALE Weber Dandelion

LTQ. gravelly floor of balsam poplar grove, lake shore (in flower June 5, 1953), No. 4676; NL. roadside ditch through farmlands, No. 2668; Amos, farm field, No. 5721.

An abundant weed of farm fields, waste ground, and of clearings even when far removed from settlements.

SONCHUS ARVENSIS L. Perennial Sow Thistle

Coch. roadside at shore of small lake (in flower and fruit August 10, 1952), No. 3875.

This material has peduncles with coarse gland-tipped hairs, thus placing it with the typical variety in the treatment of Gray's Man.

That we got only one collection of the typical variety suggests it is rare. It was also collected at New Liskeard in several patches near the railway tracks by Mulligan & Bassett, No. 798 (DAO).

VM. birch-maple woods on lake shore, No. 5952; NL. roadside through willow thicket, No. 5247; Amos, roadside ditch through farmland, No. 5455; Coch. pasture field, No. 6163; Math. wet meadow (in flower July 16, 1952), No. 3196.

The above, and all other collections, have the glabrous peduncles of var. GLABRESCENS Guenth., Grab. & Wimm. (*See S. uliginosa* in the New B. & B.)

In the opinion of the farmers, sow thistle is the worst weed in the Clay Belt. Common and locally abundant throughout the farmlands of the Clay Belt and spreading to shores, thickets, and openings in the forest. Naturalized northward around the posts of the southern James B. area according to DLD.

We have no collections of SONCHUS OLERACEUS L., nor are there any specimens by other collectors in the Clay Belt. During the course of the Canadian Weed

Survey (1949) Mr. H. Groh noted observations of annual sow thistle at lat. 48° 36′ N., long. 78° 06′ W. (near Amos); at lat. 48° 45′ N., long. 79° 06′ W. (near LaSarre); and at lat. 49° 27′ N., long. 82° 30′ W. (near Kapuskasing). This species has also been reported northward at Lansdowne House (lat. 52° 14′ N., long. 87° 53′ W.) by DLD.

Sonchus asper (L.) Hill

VM. sandy clearing in birch woods, former pinery (in flower and fruit July 19, 1954), No. 5929; LTQ. clay ditch through lakeshore ash-woods, No. 5272; Kap. farm barnyard, Nos. 3446 and 3409.

The stem and rachis of the inflorescence are glabrous in No. 5929 as in the typical form in the treatment of Gray's Man. These have stipitate red glands in Nos. 5272 (with many) and 3446 (with few), which are referred to forma glandulosus Beckh. In No. 3409 the cauline leaves are undivided as in forma inermis (Bisch.) G. Beck, instead of pinnatifid as in the other collections.

An occasional weed of farmlands and clearings. Not reported northward.

Lactuca canadensis L.

Math. clearing on river-bank (in flower with young fruits July 17, 1952), No. 3273; Kap. shore of small lake, No. 3453.

These collections have all the leaves with linear-falcate lobes placing them with var. *longifolia* (Michx.) Farw.

Occasional in the Clay Belt in openings and clearings on shores of rivers and lakes. Not reported north of our region.

Lactuca biennis (Moench) Fern. Tall Blue Lettuce

LTQ. lakeshore ashwoods (in flower with young fruit July 24, 1953), No. 5276; Amos, willow thicket on old canal bank, No. 5447; Gog. rocky creek-bank, No. 6018; Long. road through black spruce forest, No. 3578.

Frequent throughout the Clay Belt on creek-banks and wet wooded shores, and in thickets and clearings.

Crepis runcinata (James) T. & G.

Tim. vacant town lot (in flower with fruit August 19, 1952), No. 4091.

Found only once in a vacant lot. It is difficult to account for the occurrence of this western plant in the Clay Belt. It may have been adventive with garden material from the west, later becoming locally established on this vacant lot. Not reported north of our region.

Prenanthes racemosa Michx.

NL. alder-thicket, rocky river shore (in flower July 27, 1953), No. 5320; Coch. rocky river shore, No. 3959; Hst. rivershore thickets, No. 3767.

Scarce in the Clay Belt on rocky rivershore thickets.

Prenanthes alba L.

Hst. clearing on river-bank (in flower August 3, 1952), No. 3712.

Rare, found only once at the western end of the Clay Belt on river-bank clearing.

HIERACIUM AURANTIACUM L. Orange Hawkweed

NL. clearing on limestone ridge, thin soil (in flower June 12, 1952), No. 2488; OttR. clearing on river-bank, No. 5851; Amos, sandy road throuph jack pine forest, No. 2903; LAO. sandbar, No. 5144; Kap. open rocky ledges above lake, No. 4891.

A common weed on dry soils found frequently far from settlements on sandy roadsides, rocky shores, dry clearings, and extending north beyond our area.

HIERACIUM FLORIBUNDUM Wimm. & Grab.

Amos, sandy road through jack pine woods (in flower July 1, 1952), No. 2895, and roadside through farmlands, No. 2982.

An occasional weed in our region on dry roadsides. Collected also at Malartic (15 miles west of Val d'Or) by Bassett & Bragg, No. 1312 (DAO). Not reported northward.

HIERACIUM PRATENSE Tausch

Amos, road through white spruce woods (in flower July 3, 1952), No. 2954; IF. roadside through wet black spruce forest, No. 5062; Kap. grassy meadow around sedge marsh, No. 4998.

An occasional weed of roadsides and meadows. Not reported north of our area.

King devil, HIERACIUM FLORENTINUM All., has been collected about 80 miles south of the Clay Belt at Levack, near Sudbury, by Bragg & Bassett, No. 404 (DAO). This aggressive weed possibly reaches our region.

HIERACIUM VULGATUM Fries

LAO. sandbar at creek outlet, willow thickets (in flower July 14, 1953), No. 5112; Kap. rocky river shore, No. 3318.

Collected only twice in the Clay Belt at widely distant points on rocky and sandy shores, in each case within sight of the northern trans-continental railway. Not reported northward.

Hieracium canadense Michx.

NL. open rocky river shore, No. 5321; Amos, sandy bank above silted lake shore, No. 5385; Dup. open rocky outcrop, No. 4127 (revised H. J. Scoggan); Gog. sandy meadow above lake shore (in flower July 24, 1954), No. 5999; Hst. sandy clearing, No. 3758 (revised H. J. Scoggan).

The above collections belong to the typical variety, which is frequent throughout the Clay Belt on open, rocky, and sandy shores, and in clearings.

Hail. alder thicket on boulder river shore (in flower July 31, 1953), No. 5370.

The inflorescences of these tall plants have many heads on long pedicels as in var. *fasciculatum* (Pursh) Fern.

This variety was found only once in the L. Timiskaming portion of the Clay Belt.

LTQ. clearing on lake shore, No. 4448 and lakeshore thickets, No. 4538; Kap. rivershore thickets (in flower July 20, 1952), No. 3303; Ger. roadside through sedge marsh, No. 6134.

These specimens have peduncles with long spreading hairs placing them with var. *hirtirameum* Fern. Although this variety was not distinguished in the field, collecting notes suggest that it is less frequent than the typical variety preferring shore thickets.

Hieracium umbellatum L. has been collected north of the Clay Belt on the Moose R. by Hustich & Tuomikoski, No. 9; and southwest of our area on L. Superior in Sibley Twp. by Taylor, Losee & Bannan, No. 1759. Both of these specimens were revised by H. J. Scoggan from *H. canadense*. Within the Clay Belt we found no true *H. umbellatum*, which, the New B. & B. states, passes into *H. canadense*. Our collections Nos. 3758 and 4127 approach most closely that species having narrower leaves a little scabrous at the margins, stems glabrous at base, and subumbellate inflorescences. The phyllaries, however, have the stalked glands of typical *H. canadense*, and they were so revised by H. J. Scoggan. It is possible that *H. umbellatum* will be found within the margin of our region most likely at the western end.

Hieracium venosum L. has been reported on L. Superior only at Batchawana (Taylor). P. V. Krotkov determined one of these specimens as typical, the other as var. *subcaulescens*, which is included in var. *nudicaule* (Michx.) Farw. in Gray's Man. Possibly it may be found within the southern margin of our region.

Hieracium scabrum Michx.

LTQ. lakeshore clearing, No. 4459; VdO. roadside through gravelly clearing, No. 5514; Dup. flank of rocky outcrop, No. 4219; Tim. dry sandy opening in jack pine forest, No. 4048B; Gog. sandy trail through black spruce woods (in flower July 26, 1954), No. 6022.

The above collections have lower internodes with the long hairs of the typical variety in the treatment of Gray's Man.

Tas. sandy opening in jack pine forest, No. 4274; Dup. open rocky outcrop, No. 4135; Math. on sand, jack pine forest, No. 3219; Tim. dry sandy opening in jack pine forest, No. 4048A.

These collections have lower internodes with the short hairs of var. *tonsum* Fern. & St. John, which sometimes (No. 4048A and B) occurs together with the typical variety. This variety has been collected as far north as the Fort George R., about 40 miles inland from James B., by E. Lepage, No. 12,707.

This species is frequent in the Clay Belt in openings in the sandy jack pine forest, flanks of rock knobs, in dry clearings, and occurs north beyond our region.

SUMMARIES AND ANALYSES

Tabular Check List

A list has been made, in tabular form for ease of reference, summarizing information contained in the catalogue and combining it with data on geographical affinities.

In the first column are listed all species and lower taxa mentioned in the catalogue. Those not recorded from within our region are bracketed.

The second column marks species which may yet be found within the Clay Belt. As indicated by evidence discussed in the catalogue, the degree of probability is scored XXX for most probable, XX for less, and X for least. For introduced species the + sign has been used similarly.

Symbols in the third column condense information noted in the catalogue for all recorded Clay Belt species which are possibly at their limit of range for these longitudes. Current work in the Hudson Bay Lowland will add a number of range extensions northward. The notes given here reflect the extent of our knowledge up to 1956. Those species unreported north of the Lake Timiskaming portion are marked T; those unreported beyond the northern margin of the Clay Belt are marked N. For those unreported in directions other than north, the usual abbreviations for compass directions have been used.

The fourth column lists geographical affinities according to the system devised by Scoggan (1950). Dr. Scoggan kindly supplied the later revisions applied in his *Flora of Manitoba* (1957) before its recent publication. The following abbreviations are used for the geographical subdivisions:—

AC—arctic circumpolar
AA—arctic American
ASC—(arctic) subarctic circumpolar
ASA—(arctic) subarctic American
ASE—(arctic) subarctic eastern American
ASW—(arctic) subarctic western American
SC—subarctic circumpolar
SA—subarctic American
SE—subarctic eastern American
SW—subarctic western American
STC—(subarctic) temperate circumpolar
STA—(subarctic) temperate American
STE—(subarctic) temperate eastern American
TC—temperate circumpolar
TA—temperate American
TE—temperate eastern American
ATL—amphi-Atlantic

The general boundaries of the subdivisions are as follows:

Temperate: Extending north to the southern boundary of the Northern Conifer Forest or of the Hudsonian Biotic Province.

Subarctic: Extending north to the northern limit of the same Forest or Province.

Arctic: Extending north of the tree-line.

Eastern and Western American:

East or west of approximately longitude 100°W. which runs through Manitoba.

For details of these subdivisions the reader is referred to Scoggan's work. Where a species is represented in our flora only by one or more varieties, it is the geographical affinities of these varieties, not the species as a whole, that are given in the tabular list.

For introduced species the origin has been marked OW for Old World and NW for New World. Where there are possibly both native and foreign elements in the population of certain species, the abbreviation N & F is used.

Table 6. Tabular Check List

1	2	3	4
Equisetum arvense, and f. *diffusum* v. *boreale*	.....	.....	AC
E. pratense	.....	.....	SC
E. sylvaticum, represented by v. *pauciramosum* f. *multiramosum*	.....	.....	ASC
E. palustre, represented by f. *verticillatum* f. *arcuatum* f. *simplex*	.....	.....	SC
(X *E. litorale*)	XX		
E. fluviatile, and f. *Linnaeanum* (f. *polystachyum*)	 XXX	.....	SC
E. hyemale, represented by	.....	.....	STA
v. *affine*	.....	N	
(v. *intermedium*)	X		
E. variegatum	.....	.....	AC
E. scirpoides	.....	.....	AC
Lycopodium Selago, represented by	.....	.....	STA
v. *patens*	.....	N	
L. lucidulum, and v. *occidentale*	.....	.....	STA
L. inundatum	.....	N	STC
L. annotinum, and v. *acrifolium*	.....	.....	ASC
(v. *pungens*)	XXX		

Table 6. Tabular Check List—Continued

1	2	3	4
Lycopodium clavatum, and v. *megastachyon*			SC
(v. *monostachyon*)	X		
L. obscurum, and v. *dendroideum*			SA
L. sabinaefolium, and v. *sitchense*			SA
L. complanatum, and v. *flabelliforme*			ASC
L. tristachyum		N	SC
(*Selaginella Selaginoides*)	XXX		
(*S. apoda*)	XX		
S. rupestris		N	STA
Isoëtes muricata			SA
I. macrospora		N	STE
Botrychium multifidum, and v. *intermedium*			STA
B. Lunaria, represented by f. *minganense*			ASC
(*B. simplex*)	XXX		
(*B. matricariaefolium*)	XX		
(*B. lanceolatum*)	XX		
B. virginianum, and v. *europaeum*			TC
Ophioglossum vulgatum, represented by v. *pseudopodum*		N	TA
Osmunda regalis, represented by v. *spectabilis*		N	STA
O. Claytoniana			STE
(*O. cinnamomea*)	see catalogue		
Woodsia ilvensis			AC
(hybrids with *W. scopulina*)	X		
(*W. Bellii*)	X		
(*W. glabella*)	XXX		

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Table 6. Tabular Check List—Continued

1	2	3	4
Woodsia ilvensis—Cont'd.			
(*W. oregana*)	X		
(*W. ? Cathcartiana*)	X		
(*W. scopulina*)	X		
Cystopteris fragilis			AC
(v. *laurentiana*)	X		
(v. *Mackayii*)	X		
C. bulbifera		N	STA
(*C. montana*)	XXX		
Pteretis pensylvanica			STA
Onoclea sensibilis			STE
(*Dryopteris Thelypteris*)	XXX		
(*D. noveboracensis*)	X		
D. disjuncta			ASC
(*D. Robertiana*)	XXX		
D. Phegopteris			ASC
D. spinulosa, and v. *fructuosa* v. *intermedia* (v. *americana*)	XXX		ASC
X *D. Boottii*		(N)	(TE)
D. cristata			ST?C
D. marginalis		T	TA
(*D. fragrans*)	XXX		
(*Polystichum Lonchitis*)	X		
(*P. Braunii*)	X		
(*Athyrium thelypterioides*)	X		
A. Filix-femina, represented by v. *Michauxii*			SE
(*Asplenium viride*)	XX		
(*A. Trichomanes*)	XX		
(*Pellaea glabella*)	X		

Table 6. Tabular Check List—Continued

1	2	3	4
(*Cryptogramma Stelleri*)	XXX		
(*Adiantum pedatum*)	X		
Pteridium aquilinum, represented by v. *pubescens* v. *latiusculum*			ST?C
Polypodium virginianum			STA
Taxus canadensis			STE
Abies balsamea			SA
(v. *phanerolepis*)	see catalogue		
(*Tsuga canadensis*)	X		
Picea glauca			ASA
(*P. rubens*)	X		
P. mariana			ASA
Larix laricina			ASA
Pinus Strobus		N	STE
P. resinosa		N	STE
P. SYLVESTRIS		N	OW
P. Banksiana			SA
Thuja occidentalis			STE
Juniperus communis, represented by v. *depressa* v. *saxatilis* (v. *megistocarpa*)	see catalogue		ASC
J. horizontalis			ASA
Typha latifolia			SA
Sparganium eurycarpum			SA
S. americanum		N	STE
S. chlorocarpum, and v. *acaule*			STE
S. angustifolium			SC
(*S. multipedunculatum*)	XX		

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Table 6. Tabular Check List—Continued

1	2	3	4
Sparganium fluctuans			STE
S. minimum			SC
Potamogeton filiformis, represented by v. *borealis*			ASC
P. vaginatus			ASC
(*P. pectinatus*)	X		
(*P. Robbinsii*)	XXX		
P. confervoides		N	STE
P. zosteriformis			SA
P. foliosus, and v. *macellus*		N	TA
P. Friesii			SA
P. strictifolius, and v. *rutiloides*			SA
P. pusillus			SC
P. obtusifolius			STC
(*P. Berchtoldi*)	see catalogue		
P. Spirillus		N	STE
P. epihydrus, including v. *Nuttallii*			ATL
P. alpinus, represented by v. *tenuifolius* v. *subellipticus*			ASA
P. amplifolius		N	STA
P. gramineus, represented by v. *graminifolius* f. *longipedunculatus* f. *terrestris* f. *maximus* f. *myriophyllus*			SC
P. natans			STC
(*P. Oakesianus*)	X		
P. praelongus			SC
P. Richardsonii			SA

Table 6. Tabular Check List—Continued

1	2	3	4
(*Zannichellia palustris*)	X X		
Najas flexilis		N	ATL
Triglochin maritima			ASC
T. palustris			ASC
Scheuchzeria palustris, represented by v. *americana*			STA
Alisma triviale			TA
Sagittaria graminea		N	STE
S. latifolia, and f. *hastata* f. *gracilis*			TA
S. cuneata			STA
Elodea canadensis			STA
E. Nuttallii		N	TA
Vallisneria americana		T	TE
Bromus ciliatus, and v. *intonsus*			SA
(*B. Kalmii*)	X		
B. INERMIS			OW
(B. SECALINUS)	++		
(B. spp.)	+		
Schizachne purpurascens			SA
FESTUCA OVINA, and f. HISPIDULA			OW
F. ?saximontana			SA
(*F. occidentalis*)	X		
F. RUBRA			OW
F. ELATIOR			OW
PUCCINELLIA NUTTALLIANA		N	NW
Glyceria borealis			SA
G. melicaria		N	TE

Table 6. Tabular Check List—Continued

1	2	3	4
Glyceria canadensis			STE
G. striata, including v. *stricta*			SA
G. grandis			SA
G. Fernaldii			STE
POA ANNUA			OW
P. COMPRESSA			OW
P. pratensis, and v. *angustifolia*			N&F
(P. TRIVIALIS)	see catalogue		
P. saltuensis, and v. *microlepis*		N	TE
P. nemoralis			STC
P. palustris			SC
(*P. alpina*)	XXX		
(*P. glauca*)	see catalogue		
DACTYLIS GLOMERATA, represented by v. CILIATA		N	OW
Phragmites communis, represented by v. *Berlandieri*			STA
Agropyron trachycaulum, and v. *majus* v. *novae-angliae* v. *glaucum* v. *unilaterale*			SA
A. SMITHII		N	NW
A. REPENS, and f. ARISTATUM			OW
HORDEUM JUBATUM			NW
H. VULGARE			OW
TRITICUM AESTIVUM			OW
SECALE CEREALE			OW
(*Elymus arenarius*)	see catalogue		

Table 6. Tabular Check List—Continued

1	2	3	4
Elymus virginicus, and v. *jejunus*			STA
E. MACOUNII		N	NW
E. canadensis			STA
ARRHENATHERUM ELATIUS, represented by f. FLAVESCENS		N	OW
Sphenopholis intermedia			STA
Trisetum spicatum, represented by v. *molle*			ASA
T. melicoides, represented by v. *majus*			STE
AVENA FATUA		N	OW
A. SATIVA			OW
Deschampsia flexuosa			AC
D. caespitosa, and v. *glauca*			ASC
Danthonia spicata, and v. *pinetorum*			STA
D. ?Alleni		N	TE
Calamagrostis canadensis, and v. *robusta*			ASA
C. inexpansa, represented by v. *brevior*			ASA
(*C. neglecta*)	see catalogue		
Agrostis alba, and v. *palustris*			N&F
A. TENUIS		N	OW
A. scabra			SA
Cinna latifolia			STC
PHLEUM PRATENSE			OW
ALOPECURUS PRATENSIS		N	OW
A. aequalis			SC
(*Muhlenbergia Richardsonis*)	X		

Table 6. Tabular Check List—Continued

1	2	3	4
(*Muhlenbergia squarrosa*)	X		
M. mexicana, and f. *ambigua*			TA
M. glomerata, represented by v. *cinnoides*			STA
M. uniflora		N	TE
Brachyelytrum erectum, represented by v. *septentrionalis*		N	STE
Oryzopsis asperifolia			STA
O. pungens			SA
O. canadensis			STA
Milium effusum		T	STC
Spartina pectinata			STA
BECKMANNIA SYZIGACHNE			NW
Phalaris arundinacea, and f. VARIEGATA			SC
Hierochloë odorata			AC
ZIZANIA AQUATICA, represented by v. ANGUSTIFOLIA			NW
PANICUM CAPILLARE, and (v. OCCIDENTALE)	++		NW
P. PHILADELPHICUM		N	NW
(*P. virgatum*)	X		
P. depauperatum, represented by v. *psilophyllum*		N	TE
P. lanuginosum, represented by v. *fasciculatum* v. *implicatum* v. *Lindheimeri*			STE
P. columbianum		N	TE
P. xanthophysum		N	TA
ECHINOCHLOA CRUSGALLI		N	OW
E. PUNGENS, represented by v. WIEGANDII		N	NW

Table 6. Tabular Check List—Continued

1	2	3	4
SETARIA GLAUCA	.....	N	OW
S. VIRIDIS	.....	N	OW
(*Andropogon Gerardi*)	XX		
(ZEA MAYS)	see catalogue		
Dulichium arundinaceum	.....	N	STA
(*Eleocharis Robbinsii*)	XXX		
E. pauciflora, represented by v. *Fernaldii*	.....	.....	SC
E. acicularis, and f. *longicaulis* v. *submersa*	.....	.....	SC
(*E. obtusa*)	XX		
E. ovata, represented by v. *Heuseri*	.....	N	ATL
E. palustris, and v. *major*	.....	.....	SC
E. ?calva	.....	.....	STA
E. uniglumis	.....	.....	SC
E. nitida	.....	N	STA
E. compressa	.....	.....	TA
(v. *atrata*)	see catalogue		
E. elliptica	.....	.....	STA
Scirpus Clintonii	.....	.....	TE
S. caespitosus, represented by ssp. *austriacus*	.....	.....	ASC
S. hudsonianus	.....	.....	SC
(*S. subterminalis*)	XXX		
(*S. Torreyi*)	XXX		
(*S. americanus*)	XXX		
S. validus, represented by v. *creber*	.....	.....	SA
S. acutus	.....	.....	STA

Table 6. Tabular Check List—Continued

1	2	3	4
Scirpus rubrotinctus			STA
S. atrovirens, and v. *georgianus*			STA
S. cyperinus, including *S. atrocinctus*, and *S. pedicellatus*			STA
Eriophorum opacum			AC
E. spissum			AA
E. gracile			SC
E. tenellum		N	STE
E. angustifolium			ASC
E. viridi-carinatum, and f. *Fellowsii*			SA
E. virginicum, and f. *album*		N	STA
Rhyncospora alba		N	STC
(*R. fusca*)	XXX		
(*Cladium mariscoides*)	XXX		
Carex gynocrates			ASC
C. chordorrhiza			AC
C. foenea		N	STA
C. vulpinoidea		N	STA
C. diandra			SC
C. prairea			TA
C. stipata			STA
C. disperma			SC
C. trisperma			ASA
(v. *Billingsii*)	see catalogue		
C. tenuiflora			ASC
C. loliacea		SE	S?C
C. canescens			ASC

Table 6. Tabular Check List—Continued

1	2	3	4
Carex brunnescens, and v. *sphaerostachya*			ASC
C. arcta			ASA
C. Deweyana, and v. *collectanea*			STA
(*C. exilis*)	XXX		
C. interior			STA
(*C. sterilis*)	XX		
C. echinata		SW	SC
C. Wiegandii		N	STE
C. cephalantha			STA
C. angustior			ASA
C. scoparia			STA
C. tribuloides		N	TE
C. projecta			STE
C. Crawfordii, and v. *vigens*			SA
C. Bebbii			STA
C. tenera		N	TA
C. adusta		N	STA
C. aenea			SA
C. praticola			SA
(*C. argyrantha*)	XXX		
C. sychnocephala		N	STA
C. leptalea			SA
C. Backii		N	STA
(*C. scirpoidea*)	XXX		
(*C. pensylvanica*)	X		
C. communis		T	TA
C. Peckii			SA

Table 6. Tabular Check List—Continued

1	2	3	4
(*Carex Emmonsii*)	XX		
C. deflexa			ASA
C. umbellata, represented by f. *vicina*		T	TE
C. abdita			SA
C. tonsa			STA
C. pedunculata			STA
C. Richardsonii			STA
C. concinna			SA
C. eburnea			SA
C. Garberi, represented by v. *bifaria*			ASA
C. aurea			SA
C. crinita, and v. *gynandra*		N	STE
C. aquatilis, including v. *cuspidata* v. *virescens*			ASC
(*C. Rousseaui*)	see catalogue		
C. nigra			SC
C. lenticularis			SA
(v. *Blakei*)	see catalogue		
C. stricta, including v. *strictior*			TE
C. Haydenii			TE
(*C. media*)	XXX		
(*C. atratiformis*)	XXX		
C. Buxbaumii			SC
(*C. Morrisseyi*)	see catalogue		
C. limosa			SC
C. paupercula			ASC
(*C. scabrata*)	X		

Table 6. Tabular Check List—Continued

1	2	3	4
Carex Houghtonii			STE
C. lasiocarpa, represented by v. *americana*			SA
C. lanuginosa			STA
C. pallescens, represented by v. *neogaea*		N	STE
C. gracillima		N	STE
C. castanea			STE
C. arctata			STE
C. debilis, represented by v. *Rudgei*			STE
C. capillaris, represented by v. *elongata*			SC
C. granularis represented by v. *Haleana*			TE
C. Crawei			TA
(*C. livida*)	XXX		
C. vaginata			AC
C. laxiflora sensu Gleason		N	TE
C. leptonervia			STE
C. flava, and v. *fertilis*			SA
C. lepidocarpa		NW	ATL
C. viridula			SA
C. pauciflora			ASC
C. lacustris		N	TA
C. atherodes			SC
(*C. Pseudo-Cyperus*)	XX		
(*C. comosa*)	X		
C. hystricina		N	TA
C. Michauxiana		N	STE+

Table 6. Tabular Check List—Continued

1	2	3	4
Carex intumescens, represented by v. *Fernaldii*	.....	N	STE
C. retrorsa	.....	.....	STA
C. rostrata	.....	.....	SC
C. oligosperma	.....	.....	SA
C. vesicaria	.....	.....	STC
(*C. saxatilis*, represented by v. *miliaris*	XX		
v. *rhomalea*)	XX		
Arisaema atrorubens	.....	T	TE
Calla palustris	.....	.....	SC
Acorus Calamus	.....	.....	STA
Spirodela polyrhiza	.....	N	TC
Lemna trisulca	.....	.....	SC
L. minor	.....	.....	SC
(*Xyris caroliniana*)	XXX		
(*X. montana*)	XXX		
Eriocaulon septangulare	.....	N	STE
(*Pontederia cordata*)	XXX		
Juncus bufonius	.....	.....	SC
J. GERARDI	.....	.....	NW
J. tenuis, and f. *discretiflorus* v. *Williamsii*	.....	.....	STA
J. Dudleyi	.....	.....	STA
(*J. Vaseyi*)	XX		
(*J. Greenei*)	X		
J. filiformis	.....	.....	SC
J. effusus, represented by v. *solutus*		N	STE
J. balticus, represented by v. *littoralis*	.....	.....	SA

Table 6. Tabular Check List—Continued

1	2	3	4
(*Juncus stygius*)	XX		
(*J. longistylis*)	XX		
J. nodosus			SA
(*J. canadensis*)	X		
J. brevicaudatus			SA
J. brachycephalus		N	TE
(*J. acuminatus*)	X		
J. alpinus, represented by v. *rariflorus*			SC
J. pelocarpus			STE
J. subtilis			STE
Luzula acuminata			STA
L. parviflora, represented by v. *melanocarpa*			ASC
(*L. multiflora*)	X		
(*L. sudetica* v. *frigida*)	see catalogue		
(*Tofieldia pusilla*)	XX		
T. glutinosa			SA
Allium Schoenoprasum and (v. *sibiricum*)	see catalogue		OW
Hemerocallis fulva		N	OW
Lilium philadelphicum			TE
(*Erythronium americanum*)	XX		
Clintonia borealis			STE
Smilacina racemosa		N	TA
S. stellata			SA
S. trifolia			SA
Maianthemum canadense, and v. *interius*			STA
Disporum trachycarpum		E	STA

Table 6. Tabular Check List—Continued

1	2	3	4
Streptopus amplexifolius, represented by v. *americanus* v. *denticulatus*			ASA
S. roseus, represented by v. *perspectus* v. *longipes*			STE
Polygonatum pubescens		T	TE
Trillium cernuum			STE
(*T. undulatum*)	XX		
Sisyrinchium montanum, represented by v. *crebrum*			SA
Iris versicolor			SE
Cypripedium arietinum		T	TE
C. Calceolus, represented by v. *parviflorum* v. *pubescens*			STA
C. acaule			STA
Orchis rotundifolia			SA
Habenaria viridis, represented by (v. *interjecta*)	XXX		SA
v. *bracteata*			
H. clavellata, represented by v. *ophioglossoides*		N	STE
H. hyperborea, and v. *huronensis*			SA
H. dilatata			ASA
H. orbiculata		N	STA
(*H. Hookeri*)	see catalogue		
H. obtusata, and v. *collectanea*			ASA
(*H. lacera*)	X		
H. psycodes			STE
(*Pogonia ophioglossoides*)	XX		
Calopogon pulchellus		N	STE

Table 6. Tabular Check List—Continued

1	2	3	4
(*Arethusa bulbosa*)	XXX		
Spiranthes lacera		T	TA
S. Romanzoffiana			ATL
Goodyera repens, represented by v. *ophioides*			SA
G. tesselata			STE
(*G. oblongifolia*)	X		
(*G. pubescens*)	X		
Listera cordata			SC
L. auriculata			STE
(*L. convallarioides*)	XXX		
Corallorhiza trifida			ASC
C. maculata			STA
C. striata		N	TA
Malaxis brachypoda		T	STE
M. unifolia		N	STE
Calypso bulbosa			SC
Salix amygdaloides		T	TA
S. PENTANDRA			OW
S. lucida, and v. *angustifolia* v. *intonsa*			STE
S. serissima			SA
S. FRAGILIS		N	OW
S. ALBA, represented by v. VITELLINA		T	OW
S. interior, and f. *Wheeleri*			SA
S. MacCalliana		SE	STA
S. pyrifolia			STA
S. cordata Michx			SE

Table 6. Tabular Check List—Continued

1	2	3	4
Salix rigida, and v. *angustata*			STE
S. lutea			STW
S. myrtillifolia			SA
S. pseudomonticola		SE	SA
S. Bebbiana			SA
S. pedicellaris, represented by v. *hypoglauca* v. *tenuescens*			SA
S. discolor			STA
S. humilis, represented by v. *keweenawensis*			STE
S. gracilis, and v. *textoris*			STA
S. candida, and f. *denudata*			SA
S. planifolia			ASA
S. pellita, and f. *psila*			STA
Populus tremuloides			SA
P. grandidentata		T	TE
P. sp.	see catalogue		
P. balsamifera, and v. *subcordata*			ASA
Myrica Gale, and v. *subglabra*			ASC
Comptonia peregrina		N	TE
(*Juglans cinerea*)	X		
Corylus cornuta			STA
Ostrya virginiana, represented by f. *glandulosa*		T	TE
Betula lutea		N	TE
B. minor			SE

Table 6. Tabular Check List—Continued

1	2	3	4
Betula papyrifera, and v. *cordifolia*			SA
B. borealis			ASE
B. pumila, represented by v. *glandulifera*			SA
Alnus crispa represented by v. *mollis*			ASA
A. rugosa, represented by v. *americana*			STA
(*Fagus grandifolia*)	X		
Quercus macrocarpa		T	TE
Q. rubra, represented by v. *borealis*		T	TE
(*Ulmus rubra*)	X		
U. americana			TE
HUMULUS LUPULUS		T	N&F
Urtica gracilis			SA
U. procera		N	TE
Laportea canadensis		T	STE
(*Comandra Richardsiana*)	X		
Geocaulon lividum			SA
Arceuthobium pusillum		N	STE
Asarum canadense		T	TE
Rumex mexicanus			STA
R. fenestratus			SA
R. orbiculatus		N	STE
R. CRISPUS		N	OW
(R. OBTUSIFOLIUS)	+		
R. maritimus represented by v. *fueginus*			SA
R. ACETOSELLA			OW

Table 6. Tabular Check List—Continued

1	2	3	4
(*Polygonum erectum*)	XXX		
P. achoreum			SA
P. AVICULARE			OW
(*P. Douglasii*)	XXX		
(*P. viviparum*)	XXX		
P. amphibium v. *stipulaceum*, and f. *simile* f. *fluitans*			SA
P. *lapathifolium*			N&F
P. SCABRUM	see catalogue		
P. Hydropiper		N	N&F
P. PERSICARIA			OW
(*P. sagittatum*)	X		
P. cilinode			STA
P. CONVOLVULUS			OW
FAGOPYRUM SAGITTATUM		N	OW
F. TATARICUM		N	OW
Polygonella articulata		N	TE
(CHENOPODIUM POLYSPERMUM)	+		
C. hybridum represented by v. *gigantospermum*		T	SA
C. ALBUM			OW
C. GLAUCUM		N	OW
C. capitatum			SC
Atriplex patula, and v. *hastata*			N&F
AXYRIS AMARANTHOIDES		N	OW
CORISPERMUM HYSSOPIFOLIUM		N	NW
SALSOLA KALI, represented by v. TENUIFOLIA		N	OW

Table 6. Tabular Check List—Continued

1	2	3	4
Amaranthus retroflexus		N	NW
A. albus		N	NW
Portulaca oleracea		T	OW
Spergula arvensis		N	OW
(*Sagina nodosa*)	XXX		
Arenaria lateriflora			SC
(*A. macrophylla*)	XXX		
(*A. dawsonensis*)	XXX		
Stellaria media			OW
S. graminea			OW
S. longifolia			SC
(*S. atrata*)	see catalogue		
S. calycantha			ASC
Cerastium vulgatum			OW
(*C. arvense*)	XX		
(*C. nutans*)	XX		
Lychnis alba		N	OW
Silene Cucubalus			OW
(*S. antirrhina*)	X		
S. noctiflora			OW
Saponaria Vaccaria		T	OW
Dianthus barbatus		N	OW
D. deltoides		T	OW
Ceratophyllum demersum		N	STA
Nuphar microphyllum		N	STE
X *N. rubrodiscum*		(N)	(TE)
N. variegatum			SA
Nymphaea odorata		N	STE

Table 6. Tabular Check List—Continued

1	2	3	4
(*Nymphaea tuberosa*)	X		
N. tetragona, represented by ssp. *Leibergi*			SA
Brasenia Schreberi		N	TC
Ranunculus trichophyllus, and v. *eradicatus*			AC
R. subrigidus			AA
(*R. longirostris*)	see catalogue		
R. Purshii			SA
R. lapponicus			AC
R. reptans, and v. *ovalis*			ASC
R. sceleratus			SC
R. abortivus, represented by v. *acrolasius*			SA
R. recurvatus		T	STE
R. pensylvanicus			STA
R. Macounii			SA
R. septentrionalis			STE
R. REPENS			OW
R. ACRIS			OW
Thalictrum dioicum			TE
T. confine			TE
T. venulosum			SA
T. dasycarpum			TA
T. polygamum			STE
Hepatica americana		N	TE
(*Anemone parviflora*)	XXX		
(*A. multifida*)	XXX		
A. riparia			STA

Table 6. Tabular Check List—Continued

1	2	3	4
Anemone canadensis			STA
A. quinquefolia, represented by v. *interior*			TE
Clematis virginiana		T	TE
C. verticillaris			TA
Caltha palustris			AC
Coptis groenlandica			ASE
Aquilegia canadensis		N	TE
(DELPHINIUM spp.)	see catalogue		
ACONITUM NAPELLUS		N	OW
Actaea rubra, and f. *neglecta*			SA
A. pachypoda		T	TE
(*Caulophyllum thalictroides*)	X		
Sanguinaria canadensis		N	TE
Adlumia fungosa		T	TE
Corydalis sempervirens			SA
C. aurea		N	STA
(*Draba arabisans*)	XXX		
(*D. lanceolata*)	XX		
(*D. nemoralis*)	XXX		
(*D. aurea*)	X		
THLASPI ARVENSE			OW
LEPIDIUM CAMPESTRE		N	OW
L. DENSIFLORUM			NW
Subularia aquatica			SC
CAPSELLA BURSA-PASTORIS			OW
NESLIA PANICULATA		N	OW
BRASSICA HIRTA		N	OW

Table 6. Tabular Check List—Continued

1	2	3	4
BRASSICA KABER, represented by v. PINNATIFIDA v. SCHKUHRIANA			OW
B. JUNCEA			OW
B. RAPA			OW
B. NAPUS			OW
ERUCASTRUM GALLICUM		N	OW
CONRINGIA ORIENTALIS		N	OW
SISYMBRIUM ALTISSIMUM		N	OW
DESCURAINIA SOPHIA		N	OW
D. Richardsonii			SA
ERYSIMUM CHEIRANTHOIDES			OW
(E. INCONSPICUUM)	+++		
RORIPPA SYLVESTRIS		N	OW
R. islandica, represented by v. *Fernaldiana* v. *hispida*			SA
BARBAREA VULGARIS, and v. ARCUATA			OW
B. orthoceras			SA
Dentaria diphylla		T	TE
(*Cardamine pratensis*, represented by (v. *palustris*) (v. *angustifolia*)	XX XX		
C. pensylvanica			SA
(*C. parviflora*)	XXX		
(*Arabis lyrata*, and v. *kamchatica*)	XXX XXX		
A. glabra		N	TC
A. hirsuta, represented by v. *pycnocarpa*			SA
(*A. divaricarpa*)	XXX		

Table 6. Tabular Check List—Continued

1	2	3	4
(*Arabis Holboellii*)	XX		
Sarracenia purpurea			SA
Drosera intermedia			SC
(*D. anglica*)	XX		
D. linearis		N	STA
D. rotundifolia, and f. *breviscapa*			SC
SEDUM PURPUREUM		N	OW
Saxifraga virginiensis		N	TE
(*S. Aizoon*)	XX		
(*Tiarella cordifolia*)	X		
Mitella nuda			SA
Chrysosplenium americanum		N	TA
(*Parnassia parviflora*)	XXX		
P. palustris, represented by v. *neogaea*			ASC
(*P. glauca*)	X		
Ribes hirtellum			STE
(*R. oxyacanthoides*)	XXX		
R. lacustre			SA
R. glandulosum			ASA
R. triste			SA
R. hudsonianum			SA
R. americanum			TA
Physocarpus opulifolius			STE
Spiraea alba			TE
S. latifolia, and v. *septentrionalis*			SE
S. tomentosa		N	TE
Pyrus floribunda		N	STE

Table 6. Tabular Check List—Continued

1	2	3	4
Pyrus melanocarpa		N	STE
Sorbus americana			STE
S. decora			SE
Amelanchier sanguinea			TE
A. huronensis			TE
A. Wiegandii		N	STE
A. humilis			TE
(*A. mucronata*)	see catalogue		
A. gaspensis			STE
A. stolonifera			STE
(*A. Fernaldii*)	see catalogue		
(*A. intermedia*)	see catalogue		
A. arborea		T	TE
A. laevis		N	STE
A. Bartramiana			SE
Crataegus ?chrysocarpa		N	STA
C. ?submollis		T	TE
C. ?succulenta, represented by v. *?macracantha*		N	TE
C. ?Douglasii		N	TA
Fragaria virginiana			STA
F. vesca, represented by v. *americana*			TA
Potentilla fruticosa			ASC
(v. *tenuifolia*)	see catalogue		
P. tridentata			ASA
P. palustris			ASC
P. argula		N	SA
P. ARGENTEA		N	OW
(*P. pensylvanica*)	XXX		

Table 6. Tabular Check List—Continued

1	2	3	4
P. RECTA		N	OW
P. norvegica			N&F
P. anserina			SC
(*Dryas integrifolia*)	see catalogue		
(*D. Drummondii*)	see catalogue		
Geum aleppicum, represented by v. *strictum*			STA
G. macrophyllum, and v. *perincisum*			SA
G. rivale			SC
Rubus Chamaemorus			ASC
R. pubescens			SA
R. paracaulis			STA
R. acaulis			ASA
(*R. parviflorus*)	XXX		
R. IDAEUS, and v. *strigosus* v. *canadensis*	see catalogue		SA
R. hispidus		T	TE
(*R. canadensis*)	XX		
Agrimonia striata		N	STA
(*A. gryposepala*)	see catalogue		
Rosa nitida		N	STE
(*R. palustris*)	X		
R. ?Woodsii, represented by v. *Fendleri*			TA
R. acicularis, and v. *Bourgeauiana*			SA
R. blanda			STA
Prunus nigra		T	TE
P. pumila		T	TA

Table 6. Tabular Check List—Continued

1	2	3	4
Prunus susquehanae		N	TA
P. depressa			TE
P. pensylvanica			STA
(*P. serotina*)	see catalogue		
P. virginiana			STA
TRIFOLIUM PRATENSE			OW
T. REPENS			OW
T. HYBRIDUM			OW
T. AGRARIUM		N	OW
MELILOTUS OFFICINALIS		N	OW
M. ALBA			OW
MEDICAGO SATIVA		N	OW
M. LUPULINA, and v. GLANDULOSA		N	OW
Astragalus ?linearis			ASW
(*A. eucosmos*)	XXX		
A. alpinus			AC
A. canadensis		N	STA
(*Oxytropis johannensis*)	XX		
(*O. splendens*)	X		
Hedysarum alpinum, represented by v. *americanum* v. *philoscia*			AA
Desmodium canadense		T	TE
VICIA ANGUSTIFOLIA, represented by v. SEGETALIS		T	OW
(V. TETRASPERMA)	+		
V. CRACCA			OW
V. americana, and v. *truncata*			STA
(*Lathyrus japonicus*)	see catalogue		

Table 6. Tabular Check List—Continued

1	2	3	4
Lathyrus palustris, and v. *linearifolius*	.....	.....	STC
L. ochroleucus	.....	.....	SA
(PISUM SATIVUM)	see catalogue		
Amphicarpa bracteata	.....	T	TE
LINUM USITATISSIMUM	.....	N	OW
Oxalis montana	.....	.....	STE
O. europaea, represented by f. *villicaulis*	.....	T	TA
Geranium Bicknellii	.....	.....	SA
Polygala paucifolia	.....	N	TE
(*P. Senega*)	XXX		
EUPHORBIA HELIOSCOPIA	.....	T	OW
E. CYPARISSIAS	.....	N	OW
E. supina	.....	N	TE
(*E. glyptosperma*)	XXX		
(*E. serpyllifolia*)	XXX		
Callitriche hermaphroditica	.....	.....	SC
C. palustris	.....	.....	SC
(*C. heterophylla*)	XX		
(*Empetrum nigrum*)	XXX		
(*E. atropurpureum*)	XXX		
Rhus typhina	.....	T	TE
(*R. glabra*)	X		
R. radicans, represented by v. *Rydbergii*	.....	N	TA
Ilex verticillata	.....	N	STE
Nemopanthus mucronata	.....	N	STE
Celastrus scandens	.....	T	TE
Acer spicatum	.....	.....	STE

Table 6. Tabular Check List—Continued

1	2	3	4
Acer pensylvanicum		T	TE
A. saccharum		T	TE
A. rubrum, and v. *trilobum*		N	STA
A. saccharinum		T	TE
A. NEGUNDO, represented by v. VIOLACEUM		N	NW
Impatiens capensis, and f. *albiflora*			SA
Rhamnus alnifolia			STA
Ceanothus ovatus		T	TE
PARTHENOCISSUS INSERTA		T	NW
(*P. quinquefolia*)	see catalogue		
Vitis riparia		T	TA
(*Tilia americana*)	see catalogue		
MALVA NEGLECTA		N	OW
(M. ROTUNDIFOLIA)	+		
M. MOSCHATA, represented by f. HETEROPHYLLA		T	OW
HYPERICUM PERFORATUM		T	OW
H. ellipticum, and f. *foliosum*		N	STE
H. boreale		N	STE
H. majus			TA
H. canadense		N	STE
H. dissimulatum		NW	TE
H. virginicum, represented by v. *Fraseri*		N	STE
Elatine minima		NW	STE
Hudsonia tomentosa		N	STA
Viola cucullata		?N	STE

Table 6. Tabular Check List—Continued

1	2	3	4
(*Viola papilionacea*)	see catalogue		
V. nephrophylla			SA
V. sororia		N	TE
V. septentrionalis		N	STE
V. Selkirkii		N	SC
V. pallens			ASA
V. incognita, represented by v. *Forbesii*			STE
V. renifolia, including v. *Brainerdii*			SA
(*V. lanceolata*)	XXX		
V. pubescens		T	TE
V. pensylvanica, and v. *leiocarpa*			TE
V. canadensis		T	TE
V. conspersa		N	TE
V. adunca		N	SA
(v. *minor*)	see catalogue		
Dirca palustris		T	TE
Elaeagnus commutata			SA
(*E. veteris-castelli*)	see catalogue		
Shepherdia canadensis			SA
Lythrum Salicaria, represented by v. TOMENTOSUM		N	OW
Epilobium angustifolium, and f. *albiflorum*			ASC
E. leptophyllum		N	TA
(*E. strictum*)	X		
E. palustre, and			ASC
(v. *grammadophyllum*)	see catalogue		
(v. *oliganthum*)	see catalogue		
(*E. leptocarpum*)	X		

Table 6. Tabular Check List—Continued

1	2	3	4
Epilobium glandulosum, represented by v. *adenocaulon* v. *occidentale*	.....	.....	SA
Oenothera biennis	.....	.....	STA
O. parviflora	.....	.....	STE
(O. NUTTALLII)	+		
O. perennis	.....	.....	STE
Circaea canadensis	.....	T	TE
C. alpina	.....	.....	SC
Myriophyllum alterniflorum	.....	.....	S?C
M. exalbescens	.....	.....	ASA
(*M. verticillatum*)	XX		
M. Farwellii	.....	N	TE
M. tenellum	.....	N	STE
Hippuris vulgaris	.....	.....	AC
Aralia racemosa	.....	T	TE
A. hispida	.....	.....	STE
A. nudicaulis	.....	.....	STA
(*Hydrocotyle americana*)	X		
Sanicula marilandica	.....	.....	STA
Osmorhiza Claytoni	.....	N	TA
O. longistylis	.....	N	TA
O. obtusa	.....	.....	STA
(*O. chilensis*)	XX		
ZIZIA APTERA	.....	NE	NW
Cicuta bulbifera	.....	.....	STA
(*C. maculata*)	XXX		
CARUM CARVI	.....	.....	OW
Sium suave	.....	.....	SA

Table 6. Tabular Check List—Continued

1	2	3	4
PASTINACA SATIVA			OW
Heracleum maximum			SA
DAUCUS CAROTA		T	OW
Cornus canadensis			ASA
C. stolonifera			SA
C. rugosa		T	TE
C. alternifolia		T	STE
Chimaphila umbellata, represented by v. *cisatlantica* v. *occidentalis*			STA
Moneses uniflora			SC
Pyrola secunda, and v. *obtusata*			AC
P. minor			ASC
P. virens			SC
P. elliptica			STA
(*P. rotundifolia*)	X		
P. asarifolia, and v. *purpurea*			STA
Monotropa uniflora			STA
M. Hypopithys		N	STC
Ledum groenlandicum			ASA
Kalmia angustifolia			SE
K. polifolia			ASA
Andromeda glaucophylla			SE
(*A. Polifolia*)	see catalogue		
Chamaedaphne calyculata, including v. *angustifolia*			ASC
Epigaea repens, represented by v. *glabrifolia*		N	STE
Gaultheria procumbens		N	STE

Table 6. Tabular Check List—Continued

1	2	3	4
Gaultheria hispidula			STA
Arctostaphylos Uva-ursi, represented by v. *coactilis* v. *adenotricha*			SA
Vaccinium uliginosum			AC
V. cespitosum			SA
(*V. ovalifolium*)	XX		
V. myrtilloides			STA
V. angustifolium, and v. *laevifolium* v. *nigrum*			SA
(*V. corymbosum*)	X		
(*V. Vitis-Idaea*)	XXX		
Oxycoccus quadripetalus, and approaching v. *microphyllus*			SA
(*O. microcarpus*)	see catalogue		
O. macrocarpus		N	STE
(*Primula intercedens*)	XX		
P. mistassinica			SA
Lysimachia terrestris			STE
L. thyrsiflora			SC
L. ciliata			TA
Trientalis borealis			ASA
(*Fraxinus americana*)	X		
F. pennsylvanica, represented by v. *Austini* v. *subintegerrima*		T	TA
F. nigra			STE
(*Gentiana crinita*)	XX		
(*G. procera*)	see catalogue		
(*G. Macounii*)	see catalogue		
(*G. gaspensis*)	XX		

Table 6. Tabular Check List—Continued

1	2	3	4
(*Gentiana nesophila*)	see catalogue		
(*G. Amarella*)	XXX		
G. rubricaulis			TE
G. linearis			SE
Halenia deflexa			STA
Menyanthes trifoliata			SC
Nymphoides cordata		N	STE
Apocynum androsaemifolium			SA
A. medium		N	STA
A. sibiricum			STA
(*Convolvulus spithamaeus*)	XX		
C. sepium, represented by f. *coloratus*			STC
(C. ARVENSIS)	++		
COLLOMIA LINEARIS		N	NW
(*Phacelia Franklinii*)	XXX		
ECHIUM VULGARE		N	OW
LITHOSPERMUM OFFICINALE		T	OW
(CYNOGLOSSUM OFFICINALE)	+		
C. boreale		T	STA
MYOSOTIS SCORPIOIDES		N	OW
M. laxa		N	STC
M. SYLVATICA		N	OW
Mertensia paniculata			SA
LAPPULA ECHINATA			OW
(*Hackelia americana*)	XXX		
Verbena hastata		N	TA
Scutellaria lateriflora			STA
S. epilobiifolia			SA

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Table 6. Tabular Check List—Continued

1	2	3	4
AGASTACHE FOENICULUM		N	NW
NEPETA CATARIA		T	OW
GLECHOMA HEDERACEA, represented by v. MICRANTHA		N	OW
Dracocephalum parviflorum		N	SA
Prunella vulgaris, represented by v. *lanceolata*, and f. *iodocalyx*			N&F
GALEOPSIS TETRAHIT, represented by v. BIFIDA, and f. ALBIFLORA			OW
Stachys palustris, including v. *nipigonensis* v. *homotricha*			SA
(MONARDA FISTULOSA)	+		
Satureja vulgaris, represented by v. *neogaea*		T	STA
Lycopus uniflorus			SA
L. americanus			STA
Mentha arvensis, represented by v. *villosa*, and f. *glabrata*			SA
(SOLANUM TUBEROSUM)	see catalogue		
Chamaesaracha grandiflora		N	TA
VERBASCUM THAPSUS		N	OW
LINARIA VULGARIS		N	OW
(L. DALMATICA)	++		
CHAENORRHINUM MINUS			OW
(COLLINSIA PARVIFLORA)	++		
Scrophularia lanceolata		T	TA
Chelone glabra, and v. *dilatata*			TE
Mimulus ringens			TE

Table 6. Tabular Check List—Continued

1	2	3	4
Mimulus glabratus, represented by v. *Fremontii*	.....	N	TA
VERONICA SERPYLLIFOLIA	.....	N	OW
V. tenella	.....	.....	SC
V. scutellata, and v. *villosa*	.....	.....	SC
V. americana	.....	.....	SA
V. peregrina, represented by v. *xalapensis*	.....	.....	SA
(*Castilleja septentrionalis*)	XXX		
(ORTHOCARPUS LUTEUS)	++		
Melampyrum lineare, represented by v. *americanum*	.....	.....	STA
Euphrasia hudsoniana	.....	.....	ASA
(*E. subarctica*)	see catalogue		
Rhinanthus Crista-galli	.....	.....	N&F
(*Pedicularis* spp.)	see catalogue		
Utricularia vulgaris	.....	.....	SC
U. minor	.....	.....	SC
U. intermedia	.....	.....	SC
U. cornuta	.....	N	STE
(*U. resupinata*)	XXX		
Pinguicula vulgaris	.....	.....	ASC
PLANTAGO MAJOR, and v. *Pilgeri*	.....	.....	N&F
(*P. Rugelii*)	see catalogue		
P. LANCEOLATA	.....	N	OW
(*Galium Aparine*)	X		
G. triflorum	.....	.....	SC
(*G. kamtschaticum*)	X		
G. boreale	.....	.....	SC

Table 6. Tabular Check List—Continued

1	2	3	4
Galium palustre		N	SC
G. trifidum			SC
G. tinctorium			STE
G. labradoricum			SA
G. asprellum			STE
(*Mitchella repens*)	X		
Diervilla Lonicera			STE
Lonicera villosa, represented by v. *Solonis* v. *calvescens*			SE
L. TATARICA		N	OW
L. canadensis			TA
L. oblongifolia			TE
L. involucrata			STA
L. dioica, represented by v. *glaucescens*			TA
L. hirsuta			TA
Symphoricarpos albus			TA
S. occidentalis		N	STA
Linnaea borealis, represented by v. *americana*			ASA
(*Triosteum aurantiacum*)	X		
Viburnum cassinoides		N	STE
V. edule			ASA
V. trilobum			STA
Sambucus pubens, and f. *calva*			SA
Valeriana septentrionalis			SA
Echinocystis lobata		N	TE
CAMPANULA RAPUNCULOIDES		N	OW
C. rotundifolia			AC

Table 6. Tabular Check List—Continued

1	2	3	4
Campanula uliginosa			TE
(*C. aparinoides*)	see catalogue		
Lobelia inflata		N	TA
L. Kalmii			SA
L. Dortmanna			SC
Eupatorium maculatum			STA
E. perfoliatum		T	TE
(GRINDELIA SQUARROSA)	+		
(*Solidago caesia*)	XX		
S. squarrosa		T	TE
S. macrophylla			SE
S. hispida, and v. *lanata*			STE
(*S. Randii*)	XXX		
(*S. racemosa*)	XXX		
S. Purshii			SE
S. juncea			TE
(S. NEMORALIS)	XXX		
S. rugosa, and v. *villosa*			STE
S. canadensis			STA
S. lepida, represented by v. *fallax* v. *elongata*			STA
S. gigantea, represented by v. *leiophylla*			TA
S. graminifolia, represented by v. *Nuttallii* v. *major*			STA
Aster macrophyllus, represented by v. *velutinus* v. *sejunctus*		N	TE
A. ciliolatus			SA

Table 6. Tabular Check List—Continued

1	2	3	4
Aster modestus		E	SA
A. puniceus, and v. *firmus* v. *oligocephalus*			STA
A. radula, including v. *strictus*		W	STE
(*A. pilosus*)	X		
A. lateriflorus, including v. *tenuipes*			TE
A. simplex, and v. *ramosissimus* v. *interior*			STA
A. Tradescanti		N	STE
A. junciformis			SA
A. ptarmicoides			TA
A. nemoralis			SE
A. umbellatus, and v. *pubens*			TA
Erigeron hyssopifolius			SA
E. philadelphicus			STA
E. annuus		N	STA
E. strigosus			STA
E. angulosus, represented by v. *kamtschaticus*			SC
E. canadensis			STA
Antennaria canadensis			STE
A. neodioica, represented by v. *attenuata* v. *grandis* (v. *chlorophylla*)	see catalogue		STE
A. munda		T	TE
Anaphalis margaritacea			STA
Gnaphalium Macounii		N	TA
G. uliginosum		N	STC

Table 6. Tabular Check List—Continued

1	2	3	4
AMBROSIA TRIFIDA		N	NW
A. ARTEMISIIFOLIA, represented by v. ELATIOR		N	NW
(A. PSILOSTACHYA)	+++		
Heliopsis helianthoides, represented by v. *scabra*		N	TA
Rudbeckia laciniata		N	TA
R. SEROTINA, represented by v. SERICEA		N	NW
HELIANTHUS ANNUUS		N	NW
H. LAETIFLORUS, represented by v. SUBRHOMBOIDEUS		N	NW
H. MAXIMILIANA		N	NW
H. giganteus			TA
(*Coreopsis lanceolata*)	X		
Bidens cernua, and v. *minima*			TC
(v. *integra*)	see catalogue		
B. vulgata, represented by f. *puberula*		N	TA
B. frondosa		N	STA
Megalodonta Beckii			TA
(GAILLARDIA PULCHELLA)	+++		
ACHILLEA PTARMICA			OW
A. MILLEFOLIUM, and f. ROSEA			OW
A. lanulosa			SA
(ANTHEMIS COTULA)	+		
A. TINCTORIA		N	OW
MATRICARIA MATRICARIOIDES			NW
CHRYSANTHEMUM LEUCANTHEMUM, represented by v. PINNATIFIDUM			OW

Table 6. Tabular Check List—Continued

1	2	3	4
(CHRYSANTHEMUM BALSAMITA)	+		
(TANACETUM VULGARE)	+		
(*T. huronensis*)	X		
(*Artemisia caudata*)	XX		
(*A. canadensis*)	XX		
A. BIENNIS			NW
A. ABROTANUM		T	OW
A. VULGARIS		N	OW
A. LUDOVICIANA, represented by v. GNAPHALODES		N	NW
A. ABSINTHIUM			OW
Petasites palmatus			ASA
(*P. vitifolius*)	X		
(*P. sagittatus*)	X		
SENECIO VULGARIS			OW
S. pauperculus, represented by v. *Balsamitae*			SA
S. indecorus			SA
S. aureus, including v. *aquilonius* v. *intercursus*			SA
ARCTIUM MINUS		N	OW
(A. LAPPA)	see catalogue		
CARDUUS NUTANS, represented by v. LEIOPHYLLUS		T	OW
Cirsium vulgare		N	OW
C. muticum			STE
C. ARVENSE, and f. ALBIFLORUM			OW
CENTAUREA MONTANA		N	OW
C. JACEA		N	OW

Table 6. Tabular Check List—Concluded

1	2	3	4
CICHORIUM INTYBUS	.....	N	OW
(TRAGOPOGON PORRIFOLIUS)	+++		
T. PRATENSIS	.....	N	OW
T. MAJOR	.....	N	OW
(*Taraxacum dumetorum*)	XXX		
(T. ERYTHROSPERMUM)	+++		
T. OFFICINALE	.....	.....	OW
SONCHUS ARVENSIS, and v. GLABRESCENS	.....	.....	OW
(S. OLERACEUS)	+++		
S. ASPER, and f. GLANDULOSUS f. INERMIS	.....	N	OW
Lactuca canadensis, represented by v. *longifolia*	.....	N	TA
L. biennis	.....	.....	STA
CREPIS RUNCINATA	.....	NE	NW
Prenanthes racemosa	.....	.....	STA
P. alba	.....	.....	STA
HIERACIUM AURANTIACUM	.....	.....	OW
H. FLORIBUNDUM	.....	N	OW
H. PRATENSE	.....	N	OW
(H. FLORENTINUM)	++		
H. VULGATUM	.....	N	OW
H. canadense, and v. *fasciculatum* v. *hirtirameum*	.....	.....	STA
(*H. umbellatum*)	XX		
(*H. venosum*, and v. *nudicaule*)	X X		
H. scabrum, and v. *tonsum*	.....	.....	TE

Numerical Systematic Summary

The richness of the flora of the Clay Belt for so northern an area is evident from the numbers of different plants summarized in Table 7. The 856 species so far recorded from our region may be compared with the total of 5,523 for the range of Gray's Manual. It is worth noting that the number of introduced species is in almost the same proportion (19%) as in the range of Gray's Manual (20%), although the settlement of our region is relatively recent and sparse.

Table 7. Numerical Systematic Summary of the Vascular Plants of the Clay Belt Flora

	Families		Genera		Species		Named hybrids and additional varieties and forms	
	Nat.	Introd.	Nat.	Introd.	Nat.	Introd.	Nat.	Introd.
Pteridophyta	7	0	15	0	39	0	17	0
Spermatophyta	84	8	255	73	658	159	107	13
Gymnospermae	2	0	7	0	11	1	1	0
Angiospermae	82	8	248	73	647	158	106	13
Monocotyledoneae	16	0	69	14	245	32	44	3
Dicotyledoneae	66	8	179	59	402	126	62	10
Totals	91	8	270	73	697	159	124	13
Combined native and introduced	99		343		856		137	
Total number of different plants					993			

Estimate of the Whole Clay Belt Flora

Future collecting will add to the presently recorded number of 856 species. How large that addition to the list will be, can now only be estimated as in Table 8. This estimate is based on records from nearby areas and on the known ranges of the species. These reports, and the likelihood of the occurrence of certain species within the margins of the Clay Belt, have been discussed throughout the catalogue and tabulated in the check list.

Since this is the first attempt to list the Clay Belt species, the estimate (Table 8) has some value as an indication of the probable size of the whole flora. An original estimate, together with a list of 'possibles' and 'probables,' was in constant use during the course of the field work. It was repeatedly revised. In the first season, 746 species were represented in our collections. The second year added 75 more and amplified collections of rare and critical species. By the third season, when only 35 species were added while exploring the remote portions of [illegible]rion, more work yielded fewer additions.

Table 8. Estimate of Plants Which May Yet Be Found within the Clay Belt

	Probability			
	Most	Less	Least	Totals
Species:				
Native	62	41	59	162
Introduced	6	6	12	24
Named hybrids, additional varieties, and forms:				
Native	6	3	5	14
Introduced	0	1	0	1
Totals	74	51	76	201

Much local interest in floristics by researchers in forestry, agriculture, entomology, wildlife management, and by resident amateur naturalists is another reason for drawing attention to the species yet to be expected in our region. Some emphasis on probabilities and possibilities will serve, therefore, to alert and stimulate such interest. Collecting by these applied scientists and naturalists will add rare and overlooked species to the first catalogue and list presented here.

Limits of Specific Ranges

Notes in the catalogue concerning species unreported northward, and to the east and west, are indications of the number of species at the limits of their range in the Clay Belt. These are tabulated in the check list and summarized in Table 9.

Table 9. Numbers of Species Possibly at Limits of Range in the Clay Belt

	Unreported north of L. Timiskaming portion		Unreported beyond northern margin		Total unreported northward		Numbers unreported in directions other than northward					
	Number	Per cent of flora	Number	Per cent of flora	Number	Per cent of flora	NE	E	SE	NW	W	SW
Native	52	6	139	16	191	22	–	2	3	3	1	1
Old World	13	2	63	7	76	9	–	–	–	–	–	–
New World	1	tr	18	2	19	2	2	–	–	–	–	–
Total introduced	14	2	81	9	95	11	2	–	–	–	–	–
With both native and foreign elements	1	tr	1	tr	2	tr	–	–	–	–	–	–
Totals	67	8	221	26	288	34						

Since much collecting remains to be done in the general area, of which the Clay Belt is only a part, species will be added to this list, and more will be reported northward. Further work in the Hudson Bay Lowland now being undertaken by the National Museum of Canada will also add to the number of species known to occur in that region.

As far as our present knowledge goes, it will be seen from Table 9 that 8 per cent of the flora is unreported north of the Lake Timiskaming portion, and another 26 per cent unreported beyond the northern margin of the Clay Belt.

We may get some idea of the reduction in the number of species passing northward through the Clay Belt by comparison with neighbouring areas, for which lists are available. In each case only species have been counted, not named hybrids nor additional lower taxa. The totals are only roughly comparable because of different concepts of species, varying degrees of completeness in the lists, and other factors.

	Species
Southern Ontario (Soper, 1949)	2,144
Flore Laurentienne (Victorin, 1935)	1,568
Batchawana, L. Superior (Taylor, 1938)	633
The Clay Belt (Table 7)	856
Subarctic Hudson Bay Lowland (Hustich, 1957, estimate)	735
Western slope of James Bay (Dutilly, Lepage & Duman, 1954)	722
James Bay (J. M. Macoun, 1889)	509
Foot of James Bay (Potter, 1934)	317

The southern Ontario area includes all the Province underlain by Palæozoic rocks south of the Precambrian Shield. It includes the rich flora of the Deciduous Forest Region (Halliday, 1937) along Lake Erie as well as the Great Lakes – St. Lawrence Forest Region northward. That accounts for the decrease in number of species to the Flore Laurentienne in Quebec, which takes in Great Lakes – St. Lawrence Forest and a southern portion of the Boreal Forest Region. There is a large decrease at Batchawana close to the northern boundary of the Great Lakes – St. Lawrence Forest. Of the field parties led by Taylor and Hosie on the north shore of Lake Superior from 1935 to 1939, the only published list is that of Batchawana.

Passing north of the Clay Belt there is another reduction to the area embraced by Dutilly, Lepage & Duman's list, although that includes several floristic regions: the James Bay portion of the Palæozoic Hudson Bay Lowland, the Precambrian country of the interior of northern Ontario, and the southern arctic outlier at Cape Henrietta Maria. Hustich's (1957) estimate starts from the catalogue in Dutilly, Lepage, and Duman (1954), subtracts species occurring only in the Precambrian portion, adds his own collections in the subarctic Hudson Bay Lowland, and also species recorded on the Harricanaw R. (Dutilly and Lepage, 1952), near York Factory (Scoggan, 1950) and Churchill (Ritchie, 1956). Hustich remarks that this amounts to a very rich flora, considering the climatic position of the region.

A substantial reduction occurs south of the James Bay flora. The number credited to J. M. Macoun is taken from lists for the shores and islands of James Bay (207 species), including the Rupert River (296) and the Moose River (346), to make a total of 509 different species. Potter's total of 317 species for the foot of James Bay is roughly equivalent to J. M. Macoun's total for the Moose River area.

Two further points apply to this analysis. There are many large and small extensions of range in our catalogue. There is little value in enumerating all these since the more important ones have been discussed in the catalogue. It should be pointed out, however, that these extensions of range are mostly found in the rarer species at the limit of their range and unreported north of the Lake Timiskaming portion or beyond the northern margin of the Clay Belt (marked T and N in Table 6). Secondly, it is notable that very few species are at the eastern or western limits of their reported ranges. This emphasizes the wide-ranging character of our flora. There are few existing natural barriers to expansion of range in the southeast-northwest direction. There is, indeed, very little reflection in the flora of changes from east to west in gradually decreasing rainfall and increasing lime content of the soils. The influence of these factors may appear in the frequency of certain species in the plant communities when these can be analysed quantitatively.

When the field work was begun, it was thought that there might be some special floristic features of the isolated limestone areas and possibly on the tops of hills above the highest beaches of Lake Barlow-Ojibway. We found, however, that these places supported communities with the same species content as otherwise similar sites throughout the Clay Belt.

No doubt many of the weeds and other foreign species at present unreported northward will follow settlement northward. In our area the railway line at Moosonee on James Bay (Map 2) would be the expected route of introduction. Dutilly, Lepage, and Duman (1954) record the presence of many anthropochores at the railhead.

Analyses of Geographical Affinities

It is too early yet in our understanding of the true affinities of the boreal forest plants to attempt a complete analysis of the Clay Belt flora. In general terms it can be said that the flora of our region contains an unexpectedly large number of temperate species and a surprisingly small number of arctic and (arctic) subarctic species for such a cold and northern region.

Some affinities, however, do appear clearly in the Clay Belt flora, and these may be made more definite by analysis along the lines suggested by Scoggan (1950) as revised in his *Flora of Manitoba* (1957) in the light of further knowledge of specific ranges. The vague statements in the manuals for the northern limits of ranges (e.g. Labrador to Alaska) reflect the inadequacy of our present floristic knowledge of the subarctic. In the case of the better known tree species, a study of their affinities has already been attempted in the discussion of the Clay Belt forest. Considering the whole flora, Tables 10 and 11 have been made, therefore, for what they are worth, in view of all these inadequacies.

Table 10. Geographical Affinities of Clay Belt Species I

Subdivisions	Numbers	Percentage of whole flora	Unreported north of:		Unreported:	
			Timiskaming portion	Northern margin	East	West
Arctic circumpolar	18	2	—	—	—	—
Arctic American	3	trace	—	—	—	—
Total Arctic	21	2	—	—	—	—
(Arctic) subarctic circumpolar	36	4	—	—	—	—
(Arctic) subarctic American	32	4	—	—	—	—
(Arctic) subarctic eastern American	2	trace	—	—	—	—
(Arctic) subarctic western American	1	trace	—	—	—	—
Total (Arctic) subarctic	71	8	—	—	—	—
Subarctic circumpolar	66	8	—	3	1	1
Subarctic American	125	15	1	3	2	—
Subarctic eastern American	14	2	—	—	—	—
Total Subarctic	205	24	1	6	3	1
(Subarctic) temperate circumpolar	15	2	1	5	—	—
(Subarctic) temperate American	123	14	2	27	2	—
(Subarctic) temperate eastern American	101	12	4	45	—	2
(Subarctic) temperate western American	1	trace	—	—	—	—
Total (Subarctic) temperate	240	28	7	77	2	2
Temperate circumpolar	5	1	—	3	—	—
Temperate American	56	6	9	25	—	—
Temperate eastern American	85	10	35	26	—	1
Total Temperate	146	17	44	54	—	1
Amphi-Atlantic	5	1	—	2	—	1
Old World introduced	129	15	13	63	—	—
New World introduced	29	3	1	18	2	—
With both native and foreign elements	10	1	1	1	—	—

Table 11. Geographical Affinities of Clay Belt Species II

	Circum-polar	American	Eastern American	Western American	Unreported north of: Timiskaming portion	Unreported north of: Northern margin	Unreported: East	Unreported: West
Arctic.....	18	3	—	—	—	—	—	—
(Arctic) Subarctic...	36	32	2	1	—	—	—	—
Subarctic.....	66	125	14	—	1	6	3	1
(Subarctic) Temperate..	15	123	101	1	7	77	2	2
Temperate....	5	56	85	—	44	54	—	1
Totals.....	140	339	202	2	52	137	5	4
Percentage of whole flora....	16	40	24	tr	6	16	1	tr

Tables 10 and 11 bring out a large number of relationships. Taking proportion first, it is seen (Table 10) that the largest geographical subdivisions are subarctic American (15%), (subarctic) temperate American (14%), (subarctic) temperate eastern American (12%), and temperate eastern American (10%). In the larger classes, (subarctic) temperate (28%) holds first place, followed by subarctic (24%): and Table 11 shows that American (40%) outranks eastern American (24%), circumpolar (16%), and western American (trace).

Turning now to relationships with respect to limits of range, it is seen (Table 10) that 35 of the 52 native species unreported north of the Timiskaming portion are in the temperate eastern American subdivision, and that 44 of the 52 are in the temperate class. Of the 139 (137 plus 2 amphi-Atlantic) native species unreported beyond the northern margin of the Clay Belt, the largest subdivision is (subarctic) temperate eastern American (45), and the largest class is subarctic temperate (77).

These analyses reinforce in some detail the general conclusion stated at the beginning of this section.

Some conclusions concerning the forest classification of our area can be drawn from these floristic studies. The presence of many temperate eastern American species at the limits of their ranges in the Lake Timiskaming portion warrants its separation from the northern Clay Belt Forest. The affinities of the flora of this Little Clay Belt are definitely with the Great Lakes – St. Lawrence Forest Region. Floristic evidence confirms the major boundary which Halliday (1937) placed here (*See* Map 4) between his Haileybury Forest Section of the Great Lakes – St. Lawrence Forest and the Boreal Forest Region.

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The larger proportion of species, which evidently attain their limit of range for these longitudes within the northern margin of the region, supports the distinction of a northern Clay Belt forest in the larger northern part of the basin of glacial Lake Barlow-Ojibway. The vegetation of this Great Clay Belt is remarkably uniform floristically. Although there may be some practical value in subdividing into conveniently smaller forest sections, their boundaries would be indefinite and artificial. The whole of the Clay Belt can probably be treated best as a single floristic region within the subarctic forest.

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INDEX TO PLANT NAMES

Roman type is used for Latin names of all Clay Belt plants.

Page numbers in **bold-face** refer to principal discussion in Catalogue.

Italic type is used for synonyms, species unrecorded in the region, and species mentioned only incidentally in the text.

For common names of trees and the chief weeds and crop plants, the page numbers refer only to the Catalogue.

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